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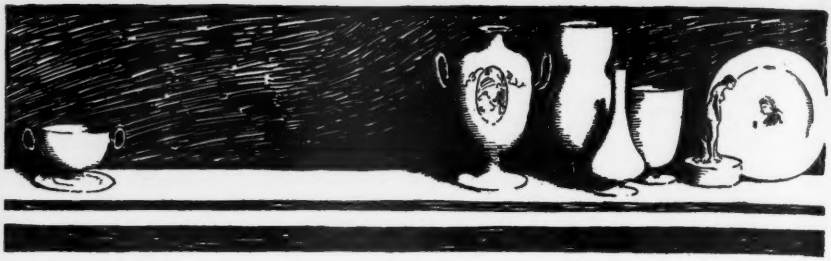

# *The Story of Sevres Porcelain*

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What Sevres porcelain is to ceramic art, Twentieth Century porcelain is to prosthetic dental restorations.

The Dentists' Supply Company
220 West Forty-Second Street New York

THE
DENTAL DIGEST

Vol. XXIV MAY, 1918 No. 5

# CONSERVATION OF PLATINUM IN DENTISTRY*

THE CONSTITUTION, PHYSICAL PROPERTIES AND PRACTICAL APPLICATION OF GOLD ALLOYS REPLACING PLATINUM AND IRIDIUM FOR DENTAL PURPOSES, WITH THE OBJECT OF CONSERVING PLATINUM METALS FOR THE BENEFIT OF THE GOVERNMENT

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The war is bringing to each of us his chance to render practical service. Sometimes it is of small value, sometimes great.

It is logical that in our special line we should be able to render service of special value, and thousands of us are doing it. Here is an opportunity for each dentist to do a particularly valuable "bit."

The Government needs platinum, great quanties of it. Each airplane that carries an American pilot needs platinum spark plug points and contact points, that his engine may be sure to run while he serves. Every shell sent from a gun needs platinum, and we need to see that the shell has it. In many ways platinum or its alloys are essential.

In the extensive article of which the following is the first instalment, the author tells how we may avoid using platinum through the substitution of other metals and alloys, and every grain of platinum we save in this way may help to save us and ours.

Mr. Conner of the War Industries Board told me that the Government wishes to derange the practice of dentistry as little as possible, and believes that the fine spirit the dental profession has already shown will result in the voluntary conservation of platinum and render any drastic regulations unnecessary.

This article may seem "dry" to some; but it is practical and very important. Read it and make or buy the necessary alloys as a patriotic duty. The first article is a summary of the subject matter. Detailed information will appear in the issues immediately following.

Let us set a record in platinum conservation.—Editor.

Early in March of this year, the Government—through the War Industries Board of the Council of National Defense—announced that

*Read before the Michigan State Dental Society, at its annual meeting in Detroit, on April 9, 1918.

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there was a very serious shortage in platinum, and the consequent necessity of conserving platinum and platinum metals, at the same time curtailing and in some cases entirely prohibiting the use of platinum in the manufacture of articles for purposes of luxury and other non-essential industries.

Mr. C. H. Conner of the War Industries Board has been appointed Administrator of Platinum, and recognizing that this metal is highly essential in the practice of dentistry, urges all members of the profession to avoid unnecessary use of platinum; to use it economically when required, and to further aid the conservation of the supply by employing efficient substitutes whenever and wherever possible.

The Government has established fixed prices for both refined and crude platinum, as a measure for eliminating hoarding, speculation and consequent extortion, and furthermore urges all dentists and others to abstain from disposing of any platinum or alloys containing platinum in any form, except to refiners or manufacturers controlled by the Government. Arrangements are being completed for the handling of platinum, platinum alloys and dental gold scrap containing considerable percentages of platinum, etc., by the government, probably at the United States Assay Office or some similar institution.

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The author of the contribution presented herein offers the results of his metallurgical investigations to the dental profession in the belief that such formulas as he advocates will prove real platinum "conservators," and thereby aid the profession as well as the Government, and postpone the day when the grim necessities of war may compel the withdrawal of all platinum from dentistry, which would prove a calamity indeed. Extensive inquiry among dentists in various parts of the country shows that there are surprisingly large quantities of platinum in various forms in their possession.

The accumulations consist of both new metal and scraps in quantities far beyond normal individual needs; innumerable old platinum pin teeth which could be used as such only on rare occasions; old platinum plates and platinum alloys for which there is no immediate demand at the hands of the owners. These accumulations (hoardings in some cases) if surrendered, refined and worked up into new metals and various alloys should supply the dental profession with ample platinum for a long time to come, and provide a considerable quantity for the immediate needs of the Government.

As a tribute to the unselfishness and patriotism of a great many mem-

bers of the dental profession, the author wishes to state that all those with whom he has taken up the matter have promised to surrender unconditionally to the Government all platinum in their possession. It is hoped that such extreme sacrifices will not be called for, and that the profession will "keep going" for a long time to come on the material in its possession, equitably redistributed.

All practitioners are urged to abstain not only from the use of platinum and iridio platinum, where other alloys will serve as well or better, but also to employ for vulcanite work teeth with pins made of metal or alloys other than platinum. Such teeth have been manufactured for a number of years and have demonstrated their efficiency, in many cases proving superior to platinum pin teeth. Practitioners not in accord with this contention should at least give it the benefit of the doubt in this emergency, and abstain from the use of platinum pin teeth until such time as the platinum situation becomes less critical.

Another considerable saving in platinum may be made by utilizing various interchangeable or replaceable porcelain facings and crowns for bridge work, etc., in place of platinum pin facings.

Some of the manufacturers of other dental goods containing platinum have shown a very commendable attitude by endeavoring to reduce the amount of platinum employed. One, in particular, has been consuming nearly 100 ounces monthly and has modified his formula so as to reduce the amount of platinum required to one-third without, in any way, lowering the quality of his alloy—in fact improving it. The author cites this case as an indication of what may be accomplished by earnest and intelligent effort. It is hoped that numerous other effective ways and means of conserving platinum will suggest themselves to all dentists and other consumers of platinum.

Quite recently a number of so-called platinum substitutes have been placed on the market, made from both secret and patented formulae. It is unfortunate that none of these alloys have so far proven efficient substitutes for platinum and iridio platinum, in spite of the claims made for them. Not one of these alloys has so far been able to replace platinum foil for porcelain jacket crowns, inlays, etc., or platinum sheet required for continuous gum plates. Fortunately, the foil used in porcelain work is almost entirely conserved, as it can be readily reworked and used over and over again, and the continuous gum plates made so few in number as to require, comparatively speaking, but a trivial amount of platinum.

It is hoped that further experimentation will not cease, but go on with more successful results in order to provide substitutes for platinum in connection with porcelain, thereby still further conserving the supply.

A considerable portion of the material in the following pages was presented to the profession over three years ago.* It has stood the test of time, which gives it more value in this emergency than it could have if the material presented were entirely new. The majority of alloys of which the formulae are given have demonstrated their efficiency in the hands of a considerable number of practitioners during a period of over five years, and within certain limitations should serve to replace the bulk of platinum and iridio platinum consumed.

The principal and practically the only limitation to the application of the alloys advocated lies in the fact that they cannot be employed directly in connection with high fusing porcelain because all of them fuse at a lower temperature than high fusing bodies. The amount of platinum used by dentists in connection with porcelain is almost insignificant as compared with the amounts used for other dental purposes in which the extremely high melting point of platinum is not necessary or essential. The author feels justified in maintaining that such alloys as he has developed, or similar ones that others may suggest, should adequately replace a great deal of the platinum consumed either through lack of knowledge of satisfactory substitutes or for purposes where ordinary gold alloys are inadequate and platinum has been employed.

All the alloys under consideration in the following pages contain gold as the principal ingredient (over 65%), and may therefore be termed precious metal alloys. The rather complex formulae are based upon the results of a series of researches inaugurated to determine the behavior of gold with various other metals in the form of binary alloys. As the findings of the author are almost entirely contrary to all works on dental metallurgy which have appeared heretofore, it seems advisable to give a rather extended description of the binary alloys of gold in order to indicate and clarify to the reader the basis upon which the complex alloys have been founded.

(The following abstracts give a synopsis of the matter to follow in the succeeding issues of the DENTAL DIGEST):

ABSTRACT FROM SECTION ON BINARY ALLOYS OF GOLD

MELTING POINTS OF THE METALS USED IN THE ALLOYS**

| | | | |
|---|---|---|---|
| Gold . . | 1945° F.—1063° C. | Silver . | 1761° F.— 960° C. |
| Copper . | 1981° F.—1083° C. | Platinum. | 3190° F.—1755° C. |
| Palladium. | 2820° F.—1550° C. | Zinc . . | 787° F.— 420° C. |

*Weinstein—Metallurgy of gold and its alloys, refractory materials and fluxes. Pages 357-407, Peeso's Crown and Bridge Work. Pages 1013-1063, Prothero's Prosthetic Dentistry.

**Circular, U. S. Bureau of Standards.

*Gold–Silver.*—Silver, in such proportions as may be utilized in dental golds, does not harden or reduce the melting point of pure gold. It acts merely as a cheapening agent, and is employed in the author's alloys but to a limited extent, either as a color modifying agent or additional solvent in order to aid in combining the other metals with the gold content.

MELTING POINTS OF ALLOYS OF GOLD AND SILVER

| | | | | | |
|---|---|---|---|---|---|
| 95% Au. | 5% Ag. | M. P. | 1945° F. | 1063° C. |
| 90 " " | 10 " " | " | 1945° F. | 1063° C. |
| 85 " " | 15 " " | " | 1943° F. | 1062° C. |
| 70 " " | 30 " " | " | 1942° F. | 1061° C. |

*Gold–Copper.*—Copper has proven a most useful and effective hardening agent in gold alloys, in which strength, tenacity, and elasticity are essential. It is far superior to platinum in that respect, but should not be employed in very high proportions, because of its susceptibility to oxidation, and consequent discoloration when in contact with mouth fluids.

Copper lowers the melting point of gold to a very considerable extent, and when used in proportions exceeding 15 per cent. produces ununiform and brittle alloys which cannot be depended upon either for strength or resistance to oxidation.

MELTING POINTS OF ALLOYS OF GOLD AND COPPER

| | | | | |
|---|---|---|---|---|
| 95% Au. | 5% Cu. | M. P. | 1840° F. | 1004° C. |
| 90 " " | 10 " " | " | 1735° F. | 946° C. |
| 85 " " | 15 " " | " | 1690° F. | 921° C. |
| 82 " " | 18 " " | " | 1661° F. | 905° C. |

*Gold–Platinum.*—Platinum raises the melting point of gold to a very considerable extent, and also acts as a hardening agent, but is not as efficient as copper for that purpose. It is, however, very valuable because it acts as an adjunct to copper as a hardening agent in gold alloys, serving to restore the melting point lowered by the copper. It produces ununiform alloys with gold when high percentages are employed.

MELTING POINTS OF ALLOYS OF GOLD AND PLATINUM

| | | | | |
|---|---|---|---|---|
| 95% Au. | 5% Pt. | M. P. | 2015° F. | 1102° C. |
| 90 " " | 10 " " | " | 2085° F. | 1141° C. |
| 85 " " | 15 " " | " | 2165° F. | 1165° C. |
| 80 " " | 20 " " | " | 2260° F. | 1228° C. |

*Gold–Palladium.*—Palladium is a metal very similar to platinum but

of much lower specific gravity. It does not confer hardness upon gold to the same extent as platinum, but raises the melting point of gold more than platinum (up to a certain limit), although its melting point is lower than that of platinum.

It alloys perfectly with gold in almost all proportions and is employed with platinum in alloys demanding a high melting point where a large quantity of platinum, if used alone, would produce an ununiform alloy. Palladium decolorizes gold much more than platinum.

MELTING POINTS OF ALLOYS OF GOLD AND PALLADIUM

| | | | | | |
|---|---|---|---|---|---|
| 95% Au. | 5% Pd. | M. P. | 2060° F. | 1127° C. |
| 90 " " | 10 " " | " | 2145° F. | 1174° C. |
| 85 " " | 15 " " | " | 2250° F. | 1232° C. |
| 80 " " | 20 " " | " | 2340° F. | 1282° C. |

ABSTRACT FROM SECTION ON ALLOYS FOR CROWN AND BRIDGE WORK

| | | | |
|---|---|---|---|
| FORMULA OF GOLD PLATE NO. 1 | Gold . . . . . | 88.0% | MELTING POINT 2075° F.—1135° C. (Pure gold 1945° F.) |
| | Platinum. . . . . | 7.5 " | |
| | Palladium . . . . . | 2.5 " | |
| | Silver. . . . . | 2.0 " | |

This alloy is equivalent in hardness to ordinary 22K. (copper-silver alloy) gold. It is non-oxidizable, containing no copper, and melts at a temperature so much higher than pure gold that it may be soldered safely with pure or any alloyed gold which melts below 1945°F. It is more compatible to the soft tissues of the mouth than ordinary gold; it is quite soft and may be swaged readily and used to replace pure platinum for many purposes where a higher melting point than ordinary gold is essential, but the extremely high melting point of platinum is unnecessary.

| | | | |
|---|---|---|---|
| FORMULA OF GOLD PLATE NO. 2 | Gold . . . . . | 84.5% | MELTING POINT 1975° F.—1080° C. (Pure gold 1945° F.) |
| | Platinum. . . . . | 8.5 " | |
| | Palladium . . . . . | 2.0 " | |
| | Silver. . . . . | 0.5 " | |
| | Copper . . . . . | 4.5 " | |

This alloy is equivalent in hardness to United States coin gold. The fusing point is approximately 225° F. higher than coin gold, and it possesses all the advantages over coin gold that the No. 1 formula has over 22K. gold.

It has most advantageously replaced coin gold in the hands of many operators, because of its high fusing point and consequent margin of safety eliminating entirely the difficulties incidental to "sweating" or the

use of hard platinum (35% Ir.) extensively employed in removable bridge construction. It may be employed to advantage instead of platinum for orthodontia bands, as it melts at such a high temperature that bands as thin as .003 in. may be soldered safely with coin gold, or the highest grades of gold solder.

| | | | |
|---|---|---|---|
| | Gold | 66.0% | |
| FORMULA | Silver | 5.5 " | MELTING POINT |
| OF | Copper | 3.0 " | 2200° F.—1070° C. |
| GOLD PLATE NO. 3 | Platinum | 16.5 " | (Pure gold 1945° F.) |
| | Palladium | 9.0 " | |

In this formula there is but a small percentage of copper, and a considerable percentage of platinum which, in conjunction with the copper, serves to produce the desired degree of hardness. The palladium supplements the platinum by raising the melting point, and enables the production of a uniform alloy which could not be accomplished if the total content of platinum metals were in the form of platinum only.

The alloy melts over 250° F. above pure gold; it may therefore be soldered safely with pure gold, and as the hardness is identical with 10 per cent. iridio platinum, it serves to replace the latter in an eminently satisfactory manner, for tubing employed in removable bridge work, boxes or casings for various forms of removable bridge attachments and numerous other purposes in dentistry where iridio platinum is required because of its high melting point, and for which ordinary gold or clasp metal cannot be employed because of the comparatively low melting point.

This alloy has already been found very useful for orthodontia bands, proving a most valuable substitute for so-called 10 per cent. iridio-platinum of which very large quantities have been consumed for orthodontic purposes.

ABSTRACT FROM SECTION ON ALLOYS FOR PROSTHETIC CASTINGS

Since the introduction of the casting process, the use of alloys containing high percentages of platinum has become prevalent. When the process was first introduced, pure or slightly alloyed gold was employed with the result that cast sections had to be made quite bulky in order to obtain sufficient strength. Later, when the fallacy of such procedure became evident, operators turned to gold alloys containing a very high percentage of platinum under the impression that such alloys could be employed to cast sections of smaller bulk, but of sufficient strength, because of the high platinum content, and the alleged virtues of platinum as a hardening agent. Unfortunately a great many operators still persist in this practice.

While it is true that a very high percentage of platinum incorporated in gold will produce a hard, tough metal (ununiform) it must also be borne in mind that such an alloy must be brought to a very high temperature to attain sufficient fluidity for casting, with the consequence that the superheated metal, forced into a comparatively fusible mould (plaster-silica investment) invariably produces a rough and inaccurate casting. It is essential therefore that alloys for casting sections of bridge work, saddles, hoods or boxes for porcelain crowns, inlays, etc., etc., where strength, hardness, and durability are essential, must contain copper in a sufficient proportion to provide strength, and only sufficient platinum or platinum metals to restore the melting point lowered by the copper content.

The following two alloys have been used extensively for over five years with most excellent results and have served to vindicate the author's contentions on the subject in an eminently practical manner:

| | | | |
|---|---|---|---|
| | Gold | 80.0% | |
| FORMULA | Platinum | 9.5 " | MELTING POINT |
| OF | Palladium | 2.5 " | 1900° F.—1035° C. |
| CASTING GOLD "B" | Silver | 1.0 " | (Pure gold 1945° F.) |
| | Copper | 7.0 " | |

This formula is intended for use with the nitrous-oxid blow-pipe and does not deteriorate. Sufficient quantities for small castings can be melted with the ordinary gas and air blow-pipe. This alloy, when in the cast form, is about midway in hardness between coin gold and clasp metal.

| | | | |
|---|---|---|---|
| | Gold | 80.5% | |
| FORMULA | Platinum | 6.5 " | MELTING POINT |
| OF | Palladium | 2.0 " | 1800° F.—980° C. |
| CASTING GOLD "C" | Silver | 2.0 " | (Pure gold 1945° F.) |
| | Copper | 9.0 " | |

This alloy is identical in strength, hardness, etc., with casting gold "B" except in fusing point and resistance to the nitrous-oxid blow-pipe flame, and will produce castings equal in every respect to those made from "B." It is intended for use with the ordinary gas and air blow-pipe. If the nitrous-oxid blow-pipe is used, precaution must be taken to use a reducing flux and not to superheat the metal. This alloy can be used to advantage as a solder for uniting bands made of No. 2 Gold, as it flows at the same temperature as coin gold, and corresponds in color perfectly with No. 2.

ABSTRACT FROM SECTION ON ALLOYS FOR INLAY CASTINGS

The use of alloys high in platinum is contraindicated in inlay work just as in prosthetic castings.

| | | | |
|---|---|---|---|
| | Gold . . . . . | 97.0% | |
| FORMULA | Platinum. . . . . | 1.5 " | MELTING POINT |
| OF | Palladium . . . . . | 0.3 " | 1945° F.—1063° C. |
| CASTING GOLD "A" | Silver. . . . . | 0.3 " | (Pure gold 1945° F.) |
| | Copper . . . . . | 0.9 " | |

Pure gold has been found unsatisfactory for inlay casting on account of its inherent physical properties with the consequence that successful castings with sharp margins have been difficult to obtain. The fusing point of this alloy is the same as pure gold and it may be melted with the nitrous-oxid or ordinary gas and air blow-pipe, and it will cast almost invariably with sharp and accurate margins. It contains but a small percentage of alloying metals, sufficient to modify the physical properties of the pure gold, which enables the production of castings which will be less apt to flow or pit from occlusal stress or wear, which defects are characteristic of pure gold castings.

When harder and more durable inlay golds are required, this alloy can be combined with either casting gold "B" or "C" readily forming uniform alloys of any degree of intermediate hardness, according to the proportion used.

| | | | |
|---|---|---|---|
| FORMULA | Gold . . . . . | 95.0% | MELTING POINT |
| OF | Palladium . . . . . | 3.3 " | 1945° F.—1063° C. |
| CASTING GOLD "D" | Silver. . . . . | 0.4 " | (Pure gold 1945° F.) |
| | Copper . . . . . | 1.3 " | |

This formula is given in order to provide an alloy corresponding in color with all the preceding alloys except "A"—which is similar to pure gold in color. It is midway in hardness between pure gold and 22K. gold.

This gold can be melted for casting with either the nitrous-oxid or ordinary gas and air blow-pipe and can be alloyed readily with "B" or "C" to increase its hardness to any extent desired without changing the color, and it may be safely remelted any number of times without deterioration.

ABSTRACT FROM SECTION ON ALLOYS FOR CLASPS

Gold alloys, known as clasp metals, contain copper as a hardening agent and platinum for the purpose of restoring the melting point lowered by the copper. The lower grade clasp metals contain high percentages of copper, and low percentages of platinum, and the higher grade, vice versa. Analyses of the various clasp metals on the market (to be published later) indicate the accuracy of the author's findings on the behavior of the copper and platinum content in alloys.

Clasp metals of various formulae have been employed by dentists in the casting process with poor results. The lower fusing metals produced porous, brittle, and otherwise undependable castings. The high fusing metals produced rough castings which required a great deal of "touching up" in order to make them usable, also proving generally unsatisfactory.

Clasp metal has been used to a considerable extent in the form of dowels for cast base crowns, etc., in place of iridio platinum with poor results, principally because of the low fusing point of the wire and its deterioration by superheated casting gold.

The following alloy fuses at much higher temperature than ordinary clasp metal and has been utilized with uniform success in connection with the casting process.

| | | | |
|---|---|---|---|
| | Gold | 66.5% | |
| FORMULA | Silver | 1.5 " | MELTING POINT |
| OF | Copper | 6.5 " | 2100° F.—1150° C. |
| "ELASTIC" GOLD | Platinum | 16.5 " | (Pure gold 1945° F.) |
| | Palladium | 9.0 " | |

The alloy retains its elasticity in spite of repeated heating and soldering operations, making it more suitable than high percentage iridio platinum for split posts and other attachments for removable bridge work and numerous other dental purposes, including orthodontia appliances.

ABSTRACT FROM SECTION ON ALLOYS FOR CAST CLASPS

It has been generally believed that metals and alloys in the cast form are not equivalent to those in the forged, rolled, or drawn form. While that is true in the great majority of instances, there are exceptions in various industrial alloys, and one in dental alloys, which has proven very fortunate indeed, as it has made possible the cast clasp.

For several years a number of operators made efforts to cast clasps from metals of various formulae, including some of those originated by the author. These attempts have been practically without success, and the statement that clasps could not be cast with satisfactory results was accepted until about two years ago, when the following formula was developed.

| | | | |
|---|---|---|---|
| | Gold | 65.0% | |
| FORMULA | Silver | 4.0 " | MELTING POINT |
| OF | Copper | 9.0 " | 1960° F.—1070° C. |
| CASTING GOLD "E" | Platinum | 12.5 " | (Pure gold 1945° F.) |
| | Palladium | 7.5 " | |
| | Zinc | 1.0 " | |

This alloy produces cast clasps of exceptional strength, resiliency, and accuracy of adaptation. Dr. Nesbett of Boston has made over 300 practical cases, without developing any failures so far. The alloy fuses at practically the same temperature as pure gold, and is intended for use with the nitrous-oxid blow-pipe. It may be remelted (with a reducing flux) as often as necessary, without deterioration.

| | | | |
|---|---|---|---|
| | Gold | 67.0% | |
| FORMULA | Silver | 5.0 " | MELTING POINT |
| OF | Copper | 9.5 " | 1850° F.—1010° C. |
| CASTING GOLD "F" | Platinum | 11.0 " | (Pure gold 1945° F.) |
| | Palladium | 6.0 " | |
| | Zinc | 1.5 " | |

This alloy is identical in strength, hardness, etc., with casting gold "E," except in fusing point and resistance to the nitrous-oxid flame, and produces castings equal in every respect to those made from "E." It is intended for use with the ordinary gas and air blow-pipe. Formula "E" can be changed into formula "F" by adding to each pennyweight of "E" 3 grains of the author's formula No. 68 solder (Au. 68, Cu. 14.5, Ag. 12.5, Zn. 5.0).

"E" formula consists of three parts elastic gold, and one part No. 68 solder. Formula "F" consists of two parts elastic gold and one part No. 68 solder.

A perusal of the section on Binary Alloys will indicate to the reader the reason why two such apparently dissimilar formulae possess identical physical properties, except fusing point.

ALLOYS REPLACING PT. & IR.–PT. FOR ORTHODONTIC PURPOSES

Alloys "2," "3," "Elastic," and "E" are especially useful as they replace in an eminently satisfactory manner soft platinum and iridio platinum for orthodontic purposes.

They are superior to platinum and iridio platinum because they can be annealed readily to render them soft and workable and then tempered to restore the high degree of elasticity which is one of their inherent properties.

The faculty of attaining a spring temper makes these alloys better in many respects than the platinum or iridio platinum employed for the same purpose even if no consideration is given to the saving in cost which is no small factor. Such alloys should prove of considerable aid in the effort to conserve platinum.

A detailed description of alloys for orthodontic purposes will be given in the continuation of the article in a following issue of the DENTAL DIGEST, also in publications of the Proceedings of the Eastern Association of Angle Graduates and the American Society of Orthodontists.

(*To be continued in the June issue.*)

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## DENTAL MOTOR CAR INFORMATION

It has been arranged by the Chairman of the Dental Motor Car Committee to have sent to any person interested in Dental Motor Cars sets of photographs showing all details of the Car, direct from the photographer, at the following prices:

| | |
|---|---|
| 1 Set, 10 Plain Prints . . . . . | $2.00 |
| 1 Set, 10 Linen Prints . . . . . | 2.50 |
| 1 Set, 10 Lantern Slides . . . . . | 5.00 |

Send to the following address for these photographs.

HARRY C. BEITT,
12970 Emerson Ave.,
Cleveland, Ohio.
Commercial Photographer.

# GENERAL DEDUCTIONS AND CONCLUSIONS: THE REMEDY

By Waite A. Cotton, D.D.S., New York

SEVENTH PAPER

Septic and defective teeth, under certain conditions, are the cause of systemic disturbances; it is equally true that systemic disturbances are the cause of pathological conditions in the mouth.

Dental decay, pyorrhea, calcareous deposits, and other oral diseases, are to a very large extent due to systemic causes, and these systemic causes may be diagnosed by these oral conditions before they can be discerned in other ways.

The cell and systemic functions in which we are directly interested are those that deal with the elimination of the products of metabolism, and the varying pathological conditions of the oral cavity due to the effects of self-produced toxic substances on the digestive and eliminative tract.

Napoleon once said that, "An army travels on its stomach." This is another way of saying that an army, no matter how splendidly equipped and generaled, is useless without efficient commissary and hygienic departments. It is likewise quite possible for a man to have a highly developed brain and cerebro-spinal nervous system, together with a good development of bones and muscles, but if the department that supplies these two systems with their energy-giving material and the removal of the waste, useless, and toxic substances is not working efficiently, then the whole structure gradually disintegrates.

Present experiences would seem to show that a very large percentage of all the ills that human beings are heir to, have their beginning in the digestive and eliminative organs, particularly the eliminative, for when this function is not performed at its full efficiency, either because of disease or inadequacy, there remains in the body an accumulation of toxic substances which continue to exert an accumulative action.

The digestive, assimilative, and eliminative functions act through the secreting and excreting membranes, glands and organs and are controlled by the sympathetic nervous system. The mouth, the only cavity of the body that can be easily examined, is the beginning of the digestive tract, and being supplied by the same nerve centres, is therefore subject both directly and reflexly to all its pathological and functional disturbances.

The secretions of the oral cavity are two: the saliva and the mucous secretion. As I have pointed out in my paper on Oral Secretions, the saliva is purely a masticatory and digestive secretion, serving the oral

cavity only in mastication and as "Nature's tooth brush"; while to the mucous secretion is given the protection of this cavity and its contents against disease.

The diseases of the mouth may be classed into two general groups: local and systemic. The local should be diagnosed and permanently corrected by the observation and removal of the local causes. If the removal of a suspected local cause of any oral disease does not permanently alleviate a condition, and that condition persists, then it must be from a systemic cause to which local treatment gives only temporary relief.

Dental decay occurs through both local and systemic causes, as has been discussed in a previous paper. When the local causes have been eradicated and decay still persists, then the cause must be a systemic one, and it is evident that the mucous membrane is not producing its normal secretion for the protection of the teeth. It then becomes necessary to make a careful scientific study of the conditions existing in the mouth in their relation to the systemic conditions which are affecting the mucous secretion.

Calcareous deposits cannot be normal, or they would exist in all mouths, which is not the case. They result from abnormal secretions, and there must be a reason for this condition.

Local causes cannot produce a normal constant increase of oral secretions, or an abnormal amount of salts, or cause these salts to be more easily precipitated.

The reason why these oral secretions contain either an excess of salts or a lack of normal chemical suspension, must be of systemic origin. There may be three causes for this condition: the secreting cells may be diseased; the fluid from which they secrete may have a superabundance of these salts; or the cell itself or the nerve that supplies it, is acted upon by some toxic substance.

Granting that a cell is acted upon by a toxic substance, which is often produced by a lack of coöperative function, the cells of the secreting glands and areas of the mouth and the nerves that supply them are also acted upon by toxic material, and a definite toxic substance acting on a definite cell always produces a definite result in the mouth.

The problem is now reduced to the observation and classification of three definite things: first, the classifying of the toxic materials; second, the classifying of definite cells; and third, the classifying of the effects of the different classified toxic substances on the different classifications of cells. I shall only go into this briefly as this is such a broad subject that a paper can only contain a summary at best.

For my purposes I shall divide the toxic substances originating within

the body, and having an effect on the oral secretions, into three general divisions: first, those produced by bacteria; second, those produced by normal cell metabolism; and third, those produced by abnormal cell metabolism.

I am considering these toxic substances only in their relation to the secretions of the oral cavity.

Toxic substances produced from bacteria.—During the past year or two it has been very clearly shown that bacteria and bacterial toxins have an idiosyncrasy for localization. The toxin from any focus may localize in any part of the body, presumably a point of lowered resistance.

In a large number of adults, and still larger number of children, we find hypertrophied and diseased tonsils, adenoids, and nasal affection. Any one of these foci of bacteria is capable of producing quantities of toxic material. Some of this material is absorbed by the circulation, but a goodly part must be discharged into the esophagus and enter the stomach.

It is hardly possible for this toxic material, which is continually dropping into the stomach, to have anything but a harmful effect upon the digestive tract, especially between periods of digestion, when there is no hydrochloric acid in the stomach to neutralize or destroy the bacteria it contains. Consequently, they must have a very direct action upon the sympathetic nervous system and those fibres that supply the mucous membrane. Dental decay in childhood and youth is generally the result of a focus of this character.

Toxic substances produced by normal cell metabolism.—Every cell in the performance of its special work must take into itself energy in the form of food. The using of that energy in the performance of its work, produces waste products that must be expelled from the cell body into the intercellular space. They are then taken up by the circulatory and lymph systems and conveyed either to that group of cells or organs whose work it is to filter them out of the blood stream, or to another group of cells or organs whose duty it is to change some of these waste products into substances that the eliminating organs or filters can eliminate, for it must not be forgotten that these eliminating groups of cells cannot care for all of the waste products as they are eliminated from the single cells, but the products must be changed into substances that they can excrete.

So here we have two different classes of toxic substances from a single cell: one that can be eliminated in the form in which it leaves the cell; and one that cannot be eliminated without being changed into another chemical substance.

Creatin and Carnosin, nitrogenous waste products of muscle tissue are not eliminated as such, but are changed to other nitrogenous substances.

Of course, if we had a perfectly balanced functioning body, all of these and other toxic substances would be entirely eliminated. As we rarely have that perfectly balanced eliminating body, there are always some of these substances remaining in the body which have a reactive inhibiting effect.

Toxic substances produced by abnormal cell metabolism.—Abnormal cells or pathological cells would certainly not have the same kind of individual cell waste product as a normal functioning cell, for they are not doing a normal cell's work.

I am mentioning only the general divisions of those toxic substances that are the most prevalent and most easily observed in the mouth.

The cells of the stomach should produce a certain secretion for the digestion of food. If this secretion is not as it should be the cells are not producing the secretion that is normal. Then it is not possible for them to have the usual excretory products; this is also true of the whole digestive tract, which includes the liver, pancreas and intestines, large and small.

Abnormal cell elimination outside of the digestive tract does not appear to have a direct action on the oral secretions. This results when the whole body is affected and these uneliminated toxic substances affect the cells of the vital tract.

Cells and their characteristic elimination can be classified, as are the types, into three groups, namely: that group comprising the brain and nervous system, or the Mental; that of the muscles, and contracting cells, or the Motive; and that of the digestive, assimilative, and eliminative tract, or the Vital.

A nerve cell is different from a muscle or liver cell. It takes different kinds of food and does an entirely different kind of work. Consequently its elimination must be different. An excess of nervous activity may be observed in the urine by an increase of phosphates.

The muscle cells are again distinctively different from any other cells of the body. They also must have more of some food than other cells. Consequently their elimination must be different from the nerve cells. In the same manner the cells of the digestive, assimilative, and eliminative tract have their particular variations.

A cell waste product is a toxic substance, and if allowed to remain in the body in constantly increasing quantities will exert its effect on the tissues in proportion to its quantity and virulence, in the same manner as any drug taken by the mouth.

Having roughly classified the cells and toxic substances, very careful clinical observations and examinations are necessary to tabulate these varying effects upon the sympathetic nervous system, and through it the

ocular observation of these substances on the tissues of the mouth, for if a lack of proper function of the stomach will give a coating on the tongue in a very short time, the lack of function of other portions of this tract has its effect on other areas of the mouth. And if these cells are affected, then their secretion will be affected, and if their secretions are affected, then the contents of this cavity are also going to suffer according to the special secretion affected.

Interpretations of the oral condition of the patient in relation to systemic conditions must necessarily depend upon the accurate judging of his type, occupation, color, size, form, and bodily condition in estimating the predominating kinds of waste products and their effects on the individual according to his texture.

The type will guide us in determining what department of the body is the most used, or if evenly balanced, which one is doing the most work, so that we may note the predominating kind of cell elimination. He must also be classified as to color and size that we may determine as accurately as possible how this elimination will be taken care of, whether quickly or slowly.

Mouth form will be a guide as to how the digestive tract tends to work, whether it is slow, strong, and reliable, or quick, weak, and unreliable. For the mouth as the beginning of the digestive tract would naturally reflect the conditions and capacity of this tract. We may also infer from a man's size and occupation the relative amount of food needed for the maintenance of his body.

A urinary analysis with the quantity of perspiration will guide us as to how large a portion of these waste products are being eliminated, taking into consideration the individual's type and other variations. If there should be a considerable amount of elimination and there is not sufficient quantity in these secretions, then it is quite possible that the organs, whose duty it is to change some of the products of metabolism so that the excretory organs can eliminate them, are not functioning properly.

We should now have a very good idea of how a person is eliminating his waste products; also, what kind predominates and the probable proportion of the others.

An accumulation of combinations in these waste products will manifest themselves in a definite manner, according to the texture of the individual. For instance, an individual of fine texture and mental type will be affected in an entirely different manner from one of coarse texture and mental type.

All these toxic substances have their greatest effect on the digestive and eliminative tract, and this tract being controlled by the sympathetic

nervous system which supplies the secretions of the oral cavity, and must necessarily be affected together with the other secretions of this tract, it follows that if these secretions are not normal, abnormal conditions are bound to be present in the mouth. This must be so, for the oral cavity depends very largely upon its secretions for its immunity from disease.

## CONCLUSIONS

Sound teeth and a normal, healthy mouth cannot exist without a properly functioning body.

There are many conditions existing in the mouth which point definitely to conditions existing elsewhere in the body as the causative or contributing causes to the conditions in the oral cavity.

Purely local attention and treatment is very often merely temporizing with an evil and is not a real cure for the diseased condition.

Therefore, careful consideration and understanding in the application of the medical factors in dental cases must be combined with the local efforts toward immediate remedy of conditions in the mouth, if these conditions are to be made permanent.

It may be said that ideals are the basis of all things that are worth while in this world. Without them there would be very little inspiration for human beings to do their best.

The ideal human body is one that is evenly balanced and functioning perfectly. This being an ideal does not exist, but we, as dentists, can work toward its attainment by keeping this ideal ever before us and by enlarging our knowledge of the functions of the body that we may give more intelligent, scientific service to our patients.

Few people know health when they have it or do not have it. Consequently they do not realize when they should receive medical attention or advice until they are actually ill. Then it is very often too late to restore them to the health conditions they should be enjoying.

It is not necessary for a dentist to be an expert diagnostician in the realm of internal medicine, but he should acquire skill and knowledge in the interpretation of dental manifestations and in the application of them to systemic conditions, that he may intelligently advise his patient in the remedy of the systemic, functional, or organic basis of such conditions, and urge upon him the securing of competent medical advice to that end.

The dentist and physician must coöperate if people are to secure permanently healthy and efficient mouths. The dentist of the future must be more than a skilled artisan, if he is to fully discharge his duty to the public and to the profession of the healing art to which he belongs.

This series of papers is not given as a finished product, but is a general outline of the fundamental theories and research that I am making an especial study.

240 WEST 74TH ST.

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## 1918 DENTAL LICENSE REQUIREMENTS IN THE UNITED STATES OF AMERICA

REVISED MARCH 30, 1918

BY ALPHONSO IRWIN, D.D.S., CAMDEN, N. J.

[The following information will be of great value to all dentists or students who wish to change location from one state to another. The author has brought it up to date by correspondence with the State Boards, and it represents the latest and most authentic information obtainable. Doctor Irwin will contribute information upon dental legislation to this magazine each month.—EDITOR.]

### UNIVERSAL REQUIREMENTS

(1) All applicants must undergo an examination. (2) All examinations and writing must be conducted in the English language. (3) These examinations to be upon subjects taught in a Standard Dental College—theoretical and practical, operative and mechanical, oral and clinical. (4) The applicant must have reached the age of twenty-one years or over, possess a good moral character, certified to by two licensed dentists; under reciprocity the endorsement of two resident freeholders is required. (5) A High School education, the new laws requiring an accredited four years' course. (6) A Dental Degree; all Boards now require a degree from an accredited and reputable college, which must be countersigned by the Secretary, Registrar, Dean, or Provost; upon request the Secretary furnishes an application blank. (7) An unmounted cabinet size photograph of the applicant, attested to by the photographer. (8) All credentials to be presented to the Secretary of the Board at least one or two weeks prior to the examinations, including all licenses, if any, in the possession of the candidate; pay the license fee (ranging from $10 to $25) by a certified check or postoffice money order or cash. The applicant must present himself at the proper time and place to undergo a practical and theoretical examination before the Board of Examiners upon the subjects and tests usually taught in a Standard Dental College.

*Arizona:* New law, 1913. No one exempt from examination. All candidates examined. Dental license from another state or *dental degree required.* License fee $25.00. June examination in Bisbee. October meeting in Phoenix. No interchange. *Secretary,* EUGENE MCGUIRE, 202–203 Noll Bldg., Phoenix, Ariz.

*Arkansas:* New law, 1915. *Dental diploma required.* All applicants examined. License fee $15.00. November meeting in Little Rock. Interchange with Illinois, Kansas, Missouri. *Secretary,* I. M. STERNBERG, Fort Smith, Arkansas.

*California:* Amended law, 1915. Accredited High School diploma after August 1, 1918. Dental degree required. No interchange. License fee $25.00. June and December examinations held in San Francisco and Los Angeles. *Secretary,* C. A. HERRICK, 133 Geary Street, San Francisco, Cal.

*Colorado.* Law amended 1905. Recognized High School Certificate and Dental Degree required. All applicants examined; examinations practical, clinical, and theoretical; held during June and December in Denver. License fee $25.00. No interchange. *Secretary,* A. C. HAMM, 725 Mack Bldg., Denver, Colo.

*Connecticut:* New law, 1915. Dental degree required. Law permits interchange, but none reported. June and December examinations in Hartford. License fee $25.00. Dental Hygienists licensed; fee $10.00, subsequent (if necessary) examination $5.00. *Recorder,* EDWARD EBERLE, 902 Main Street, Hartford, Conn.

*Delaware:* Law amended 1917. Requirements unchanged. Law permits interchange; none reported. October examinations in Wilmington. License fee $20.00. *Secretary,* C. J. KINKEAD, 828 Washington Street, Wilmington, Del.

*District of Columbia:* Law of 1904. "All graduates of dental colleges which require a three years' course of study shall be entitled to certificates upon payment of the certification fee, and without examination as to their qualifications." (Last paragraph, Sec. 3.) Dental degree required. January and June examinations in Washington University. Fee $10.00. Interchange with Iowa, Kansas, Minnesota, Nebraska, Ohio, West Vir-

ginia. (See Part 1.) *Secretary*, H. P. COBEY, 1424 K Street, N. W., Washington, D. C.

*Florida:* Law of 1911. *No preliminaries;* dental degree required. January and June examinations in Jacksonville. No interchange. License fee $25.00. (See Part 1.) *Secretary*, R. P. TAYLOR, St. James Bldg., Jacksonville, Fla.

*Georgia: Law approved* 1909. *No preliminaries.* Dental degree required. Subjects of theoretical or written examinations are the same as those taught in a standard dental college. See subjects required in Michigan regulations. Examinations usually held during January and June in either Atlanta or Brunswick. No interchange. Temporary licenses issued. Fee $5.00. Regular license $10.00. (See Part 1.) *Secretary*, D. D. ATKINSON, Brunswick, Ga.

*Idaho:* Amended law; no date affixed. For prosthetic, practical or clinical examinations see Alaska, Illinois, Pennsylvania, New Hampshire, New Jersey regulations. These requirements are typical and, with few variations, could be adapted to any Dental Examining Board's requirements. Examinations required with or without diploma. January and July examinations held in Boise. Licenses exchanged with Utah only. License fee $25.00. *Secretary*, A. M. JACOBSON, 255 E. Centre Street, Pocatello, Idaho.

*Illinois:* The Illinois requirements are typical, and with few alterations could apply to nearly all State Dental examinations.

Amended law, 1915. Diploma from an accredited High School (4 years' course) or its equivalent; dental degree required; theoretical examinations in anaesthesia, anatomy, bacteriology, chemistry, embryology, histology, materia medica, metallurgy, operative dentistry, oral surgery, oral hygienics, pathology, orthodontia, physiology, prosthetic dentistry, therapeutics, in their relation to dentistry,

Practical examinations consist of one gold and one amalgam filling. The Board may substitute an additional gold filling or inlay. (Applicant must furnish all instruments and materials.)

Prosthetic work: Plastercasts, also impressions of full upper and lower denture; also bite, occlusion, mounted or anatomical articulator and trial plate ready for the mouth; construction of lower molar gold crown is required; the Board may substitute other work.

June and November examinations in Chicago.

Points in Grading: Prosthetic—First, treatment of the impression to

secure retention. Second, selection and general arrangement of the teeth. Occlusion: Third—contour or restoration of the features.

Crown Grading: First, preparation of the tooth. Second, adaptation of band to root. Third, seclusion, form. Fourth, finish.

Examination fee $20.00. License $5.00. Registration $1.00.

Reciprocity with Arkansas, Indiana, Iowa, Kansas, Kentucky, Missouri, Michigan, Nebraska, Ohio, Vermont. *Secretary*, E. F. HAZELL, Springfield, Ill.

*Indiana:* Law amended 1913. Preliminaries: College entrance credentials; diploma from a recognized dental college. All applicants examined. June and November examinations in Indianapolis. License fee $20.00. Reciprocity with Illinois, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Nebraska, Ohio, upon the following terms: "Any applicant who has been in legal and ethical practice in any of the above states for not less than five years, and who is a member of the State Dental Society and has the recommendation of the Board and Dental Society of his state, may be admitted to our examination at any regular meeting, and excused from all theoretic examination, being required to pass the practical tests only." *Secretary*, H. C. MCKITTRICK, 605 Hume-Mansur Bldg., Indianapolis, Ind.

*Iowa:* Law amended 1904. (See Part 1.) Graduation from a High School (4 years' course) or equivalent; graduation from an accredited Dental College. June and December examinations held in Des Moines or Iowa City. Reciprocity with District of Columbia, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Tennessee, Wisconsin. License fee $20.00. *Secretary*, J. A. WEST, 417 Utica Bldg., Des Moines, Iowa.

*Kansas:* Law of 1909. Diploma from High School (4 years' course) or equivalent; graduation from dental college. June and December examinations held in Topeka. Reciprocity with District of Columbia, Illinois, Indiana, Michigan, Minnesota, Ohio, Tennessee. License fee $25.00. (See Part 1.) *Secretary*, G. L. AMBROSE, El Dorado, Kans.

*Kentucky:* Amended law (See Part 1 and Appendix).

College entrance credentials for preliminaries; graduation from a dental college. June and December examinations in Louisville. Reciprocity with Alabama, Indiana, Kansas, Missouri, Tennessee, Vermont. License fee $20.00. *Secretary*, J. H. BALDWIN, 640 Atherton Bldg., Louisville, Ky.

*Louisiana:* Amended law, 1906. College entrance requirements for preliminaries; dental degree from an "accepted" dental college; semi-annual examinations, probably April or May and October in New Orleans; License fee $25.00. Reciprocity with Alabama, Illinois, Mississippi, Ohio, Wisconsin. Registration with the State Board of Health. *Secretary*, V. K. IRION, 935 Maison Blanche Building, New Orleans. Louisiana.

*Maine:* New law, 1915. Dental degree required. Examinations held in State House, Augusta, probably in June and September. Law permits interchange. Reciprocity with Vermont reported. Fee $20.00. Dental Hygienists examined and licensed. Fee $10.00. *Secretary*, WILL S. PAYSON, Castine, Me.

*Maryland:* Amended law, 1896. (See Part 1.) Dental degree required. May and November examinations each year in Baltimore. May interchange; 10 years' practice required. License fee $10.00. *Secretary-Treasurer*, F. F. DREW, 701 N. Howard Street, Baltimore, Md.

*Massachusetts:* New law, 1915. Dental diploma required. June and December examinations in State House, Boston. Law permits interchange; no agreements so far. License fee $20.00. Dental hygienists. *Secretary-Treasurer*, GEO. H. PAYNE, 29 Commonwealth Ave., Boston, Mass.

*Michigan:* Law amended 1913. High School diploma or 15 units; dental degree required. June and December examinations held in Ann Arbor. License fee $20.00. Interchange with Illinois, Indiana, Iowa, Kansas, Minnesota, Nebraska, Ohio, Pennsylvania, Wisconsin. *Secretary-Treasurer*, B. S. SUTHERLAND, Owosso, Mich.

*Minnesota:* Law amended 1911. (See Part 1.) Dental degree required. March and November examinations in State University at Minneapolis. Reciprocity with District of Columbia, Indiana, Iowa, Kansas, Michigan, Nebraska, Ohio, Wisconsin. Reciprocity fee $50.00. Regular license fee $20.00. *Secretary-Treasurer*, C. W. BENSON, 323 New Jersey Bldg., Duluth, Minn.

*Mississippi:* Amended law, 1912. Temporary license issued. Fee $10.00. High School Certificate or equivalent, and dental degree required. June examinations held in Jackson. Regular license fee $10.00.

*Secretary-Treasurer*, B. J. MARSHALL, Suite 4–7, Turner-Case Bldg., Marks, Miss.

*Missouri:* Law amended 1909. (See Part 1.) Dental diploma required. June and October examinations in Jefferson City. Fee $10.00. Address *Secretary-Treasurer*. V. R. MCCUE, Cameron, Mo.

*Montana:* Law amended 1909. Five years' practice, or dental diploma required. No interchange; law permits it; fee $50.00. Examinations second Monday in January and July in Helena. License fee $25.00. Examination fee $25.00. Address *Secretary-Treasurer*, G. A. CHEVIGNY, Yeger Bank Bldg., Butte Mont.

*Nebraska:* Law approved 1905. (See Part 1.) High School Certificate, or 14 Carnegie Units. Five years' Apprenticeship or dental degree. June and November examinations in Omaha. License fee $20.00. Interchange with District of Columbia, Iowa, Illinois, Kansas, Michigan, Minnesota, Missouri, Ohio, Tennessee, Vermont. *Secretary-Treasurer*, S. A. ALLEN, Loup City, Neb.

*Nevada:* Law approved 1905. (See Part 1.) High School and dental diplomas required. June and December examinations in Reno or Carson City. No interchange, but law permits it; 15 years' licensed practice in another state, or apprenticeship for 15 years, admits to examinations (clinical and prosthetic). Address *Secretary-Treasurer*, WM. H. CAVELL, Carson City, Nev.

*New Hampshire:* New law, 1913. High School and dental diplomas. June and December examinations in Manchester. Written examinations in anatomy and oral surgery; physiology, chemistry and metallurgy, materia medica and anaesthetics, operative and prosthetic dentistry, pathology and therapeutics, histology and bacteriology. Practical examinations consist of gold and amalgam fillings, soldering 4-tooth bridge, plate with affidavit. Fee $20.00. Dental nurse legalized. Interchange with Massachusetts, Vermont. Fee $5.00. *Secretary*, A. H. L. WATSON, 913 Elm Street, Manchester, N. H.

*New Jersey:* Amended law, 1916. Approved four years' High School diploma or equivalent and certificate of State Supervisor of Public Instruction; also dental degree required. Interchange cancelled, although law permits it. June and December examinations in Trenton.

License fee $25.00. Re-examination $10.00. Written examinations upon subjects usually taught in a Standard Dental College.

Practical test: Approximal gold filling with approximating tooth in position, compound approximal filling of amalgam, a silicate filling, test in oral prophylaxis, preparation of a cavity for an inlay, with wax pattern of same.

Prosthetic tests: Soldering bridge three or more teeth, exclusive of abutments, and one Richmond crown which may be one of the abutments; material used gold or silver. Impressions, dies and articulating models must be submitted. Wax bite, anatomical articulation of a full upper and lower denture (plain teeth) imbeded in wax on trial plate, must be submitted. *Secretary*, J. G. FORSYTH, 430 E. State Street, Trenton, N. J.

*New Mexico:* Law amended 1907. Diploma from a dental college. No interchange. No preliminary education in law. June examinations in Santa Fe. License fee $25.00. *Secretary*, M. J. MORAN, Deming, New Mex.

*New York:* Law amended 1916. Four years' registered High School and dental diplomas required, 72 Regents' Counts or equivalents, or an education accepted by the regents as fully equivalent. *No preliminaries* can be *made up* after *entrance* into a *dental* college. After January 1, 1921, a diploma from a four years' course registered dental college will be necessary. Simultaneous June and December examinations, in New York usually, or Albany and Buffalo. License fee $25.00. "No reciprocity at present," although law provides for interchange of licenses. Oral Hygienists (females) examined and licensed; fee $5.00. Registration with Board of Regents annually. *Secretary*, MINOR J. TERRY (Professional examinations), State House, Albany, N. Y.

*North Carolina:* New law, 1915. Four-year High School or equivalent; dental degree; examinations usually follow college commencements. January and June examinations in Wilmington or Durham. License fee $20.00. No reciprocity. Registration with Clerk of Superior Court and Secretary of the Board. *Secretary*, F. L. HUNT, Asheville, North Carolina.

*North Dakota.* Law amended 1915. Entrance requirements for state university or four years' High School and dental diplomas. January and July examinations in Fargo; fee $25.00. Reciprocity with "Those states having and maintaining the same requirements." Reciprocity fee $50.00. *Secretary*, W. E. HOCKING, Devils Lake, N. D.

*Ohio:* Amended law, 1915. Requirements: High School diploma; graduation from a dental college. Examinations fourth Monday in June and October, in State University, Columbus. License fee $25.00. Duplicate license $5.00. Reciprocity with District of Columbia, Iowa, Indiana, Kansas, Louisiana, Michigan, Minnesota, Nebraska, Tennessee, Wisconsin. *Secretary,* R. H. VOLLMAYER, 947 Nicholas Bldg., Toledo, Ohio.

*Oklahoma:* Law approved 1913. Requirements: High School and dental diplomas. June and December examinations in Oklahoma City. License fee $25.00. Law permits reciprocity; no agreements. *Secretary,* HARRY OVERBY, Ryan, Okla.

*Oregon:* Law amended 1916. Dental degree required. June and November examinations in Portland or Salem. License fee $25.00. No temporary permits and no interchange. *Secretary,* H. H. OLINGER, Salem, Ore.

*Pennsylvania:* Amended law, 1915. Requirements: Four years' course High School or its equivalent, 60 counts (held prior to matriculation) and dental diploma. After January 1, 1921, dental degree from a four years' course registered dental college. June and December examinations held simultaneously in Philadelphia and Pittsburgh. License fee $25.00. No interchange. *Secretary,* A. H. REYNOLDS, 4630 Cedar Ave., Philadelphia, Pa.

*Rhode Island:* Law amended 1913. Legal protection provided for examinee. High School and dental diplomas required. Usually last week of June or first week of July examinations in Providence. Fee $25.00. *Secretary,* EARNEST A. CHARBONNEL, 139 Mathewson Street, Providence, R. I.

*South Carolina:* Law amended 1911. Temporary licenses granted; State High School diploma, or its equivalent 14 units required; examinations in June in Columbia. No reciprocity. License fee $15.00. *Secretary,* R. L. SPENCER, Bennettsville, South Carolina.

*South Dakota:* Law effective 1909. Five years' practitioners and college graduates examined. January and July examinations in Sioux Falls. No reciprocity. License fee $25.00. *Secretary,* ROBERT JASMAN, Scotland, S. D.

*Tennessee:* Law amended 1913. Dental diploma required. June examinations in Nashville. Fee $15.00. Reciprocity with Iowa, Kansas, Nebraska, Ohio. Fee for incoming dentist $15.00; outgoing dentist $5.00. *Secretary*, WALTER G. HUCHISON, 308 Eve Bldg., Nashville, Tenn.

*Texas:* Law enacted 1905. Temporary licenses granted. Fee $2.00. Examinations without diploma. Fee $25.00. No interchange. June and December examinations in San Antonio. *Secretary*, HARRISON B. CAVE, 810–814 Wilson Bldg., Dallas, Tex.

*Utah:* Law amended 1909. Four years' High School and dental diplomas required. June and November examinations held in Salt Lake City. Fee $25.00. Reciprocity with none; law permits it. *Secretary*, J. F. CHRISTIANSON, Walker Bldg., Salt Lake City, Utah.

*Vermont:* Law amended 1912. High School and dental diplomas required. June examinations in Montpelier. Fee $25.00. Reciprocity with Illinois, Iowa, Indiana, Kentucky, Maryland, Nebraska, New Hampshire. *Secretary*, H. F. HAMILTON, Newport, Vt.

*Virginia:* Law amended 1914. M.D. requirement repealed. High School education and dental diplomas required. June 11th examinations in Richmond. Fee $10.00. May interchange; none reported. *Secretary*, E. U. POTTER, 303 Payne Bldg., Roanoke, Va.

*Washington:* Law amended 1913. Dental diploma required. May and November examinations in Spokane, fee $25.00. *Secretary*, J. W. RAWLINGS, 503 National Realty Bldg., Tacoma. Wash.

*West Virginia:* Law amended 1915. *Dental degree required.* June examinations in Wheeling. License fee $25.00. Interchange with District of Columbia only. *Secretary*, H. H. SMALLRIDGE, Charleston, W. Va.

*Wisconsin:* Law amended 1914. Requirements: Four years' High School or 14 units and dental diplomas. June examination in Milwaukee. Fee $25.00. Interchange with Illinois, Iowa, Kansas, Louisiana, Michigan, Minnesota, Ohio. *Secretary*, W. T. HARDY, 1404 Majestic Bldg., Milwaukee, Wis.

*Wyoming:* Amended law, 1905. No temporary permits. Dental

degree required. June 25th to 27th examinations in Cheyenne. Fee $25.00. No interchange. *Secretary*, PETER APPELL, P. O. Box 643, Cheyenne, Wyo.

*Alaska:* New law, 1913. All applicants examined; dental degree required. Theoretical and clinical examinations held the second Monday in January and July in Juneau. Fee $25.00. Law permits reciprocity. "Theoretical examinations include Operative and Prosthetic Dentistry, Osteology, Dental and General Anatomy, Histology, Bacteriology, Physiology, Pathology, Chemistry, Metallurgy, Materia Medica, Therapeutics, Orthodontia and Anaesthetics. Demonstrations in Operative and Prosthetic Dentistry will be required, also Prognosis and Diagnosis. All applicants must furnish their own material for demonstrations. If the examinations prove satisfactory to said Board of Examiners, they shall issue a certificate of registration to the person examined." (Part of Section 5.) Annual registration prior to July 1st. Fee $4.00. *Secretary*, ELMO H. KASER, Juneau, Alaska.

*Hawaii:* Law of 1903. Dental diploma required. Practical and Theoretical examinations held in January and July at Honolulu. No interchange. License fee $20.00. *Secretary*, C. B. HIGH, 53–55 Young Bldg., Honolulu, Hawaii.

*Porto Rico:* Law of 1906. Examination with or without diploma. Practical and theoretical examinations held during February and August in San Juan. Examination fee $20.00. Certificate $5.00. No interchange; the Board is authorized to decide about reciprocity. *Secretary*, L. R. NOA, 6 San Justo, San Juan, Porto Rico.

*Philippine Islands:* New law 1915. Temporary licenses issued. Fee $5.00. Dental degree required. Examinations held during January and July each year at Manila. License fee $10.00. No reciprocity. *Secretary*, LOUIS OTTOFY, 64 Escolta, Manila, P. I.

# INSTANCES OF THE RELATION OF APICAL FOCI TO SYSTEMIC CONDITIONS

By Fred D. Miller, D.D.S., Altoona, Pa.

Paper No. 2

## Mrs. B. and Her Hay Fever. Coincident or Cause?

There are some people to whom the good old summer time is regularly a nightmare. Mrs. B. was one such. Every spring for seven years a distressing form of hay fever had supervened and lasted until about the middle of September. Her condition was much worse in the mornings but by noon she was generally fairly comfortable.

Six years before the time of this story she had moved to a town near Altoona, where her husband had established his business, and she had hoped that the high altitude might effect some relief.

In the year of treatment to be described, her hay fever had commenced in May and exhibited its usual severity. She had tried many forms of treatment and this year had taken 15 injections of an antihay fever serum. The time covered by the injections was from the 1st of May until the 1st of July. No practical benefit resulted and the month which elapsed between the last injection and the time when she presented for treatment was as uncomfortable to her as any previous time.

Fig. 1

Fig. 2

She presented for the filling of several cavities and the extraction of a lower tooth. The upper right central was seen to be discolored and to present an unsightly gold inlay, though the tooth caused her *no trouble*, and it was no part of her plan for it to receive attention. She was advised to have this inlay removed, the root filled and a porcelain inlay in

the cavity. She objected to having this done at the time, because of the distress of the hay fever, and wished to postpone this work until later in the year. I suggested that possibly the tooth might be the cause of the hay fever, though I do not know that I took the suggestion very seriously myself, though I realized that it was important to fill the root so as to extirpate a possible focus and prevent reinfection. After considering the suggestion, she consented to have the tooth treated.

When the tooth was opened, there was some filling in the root canal (Fig. 1), but there was also present a mass of putrid organic material above the filling. This was removed by saponifying it with sodium and potassium, followed by Peroxide and Bichloride* solution, and the canal was dressed with a dry sterile, cotton point. This remained in position for a week. The root canal was then cleaned with sulphuric acid, dried, ionized, using a zinc chloride solution and a zinc electrode and then filled through the apex with chloropercha and gutta percha. (Fig. 2.)

Much to my surprise the patient reappeared five days later for the remaining work and said that since the day following the filling of the root she had not suffered from hay fever. She was free from it for the rest of the summer.

It developed later that the pulp had been removed from this tooth seven and one-half years before, and that the hay fever had supervened for the first time during the summer following. During the seven years every known treatment for hay fever had been tried without the slightest relief being obtained. She and I are waiting with much interest for the summer of 1918 to see whether the relief will be permanent.

I am unable to decide whether the hay fever resulted from direct infection, from focal infection or the chronic irritation of the floor of the nose from the infected root. The experience is interesting to say the least.

Naturally the patient is very enthusiastic about proper treatment for suspected teeth.

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*The peroxide and bichloride sol. is made by adding $1\frac{3}{4}$ gr. of bichloride of mercury to one ounce of peroxide and is recommended by Doctor Rhein to facilitate the removal of the saponified organic material from the canals, which is one of the essentials in root canal technique, viz.: "The removal of every particle of organic matter."

# M. O. D. CAVITIES

By O. W. Brandhorst, D.D.S., Webster Groves, Mo.

The title at once brings to our mind those large extensive cavities which extend from the mesial surface over the occlusal, and include the distal surface of the tooth.

The anatomy of the teeth limits their occurrence to the bicuspids and molars.

For convenience in discussion, let us divide the cases presenting themselves into two classes, namely: Class I, those not involving the pulp, and Class II, those in which the decay has extended so as to necessitate the removal of the pulp.

The first class, or those in which the pulp is not involved, does not as a rule present the difficulties of the second class.

While in either case the cavity preparation is of the utmost importance, that is really secondary, as we must first determine what filling material will give the desired result, and then proceed to prepare our cavity so as to be able to satisfactorily place the selected filling material.

In cavities like these, the two filling materials most widely used are amalgam and gold.

Since, as has been stated, the occurrence of the M. O. D. cavities is limited to bicuspids and molars, too many of us have a tendency to choose our filling material by the position of the tooth in the mouth. That is to say, we want to put gold into the bicuspids for aesthetic effect and think amalgam is good enough for molars, for the tooth discoloration from same is of little importance.

The object of this discussion is mainly to consider the service to the patient. Hence we shall try to choose our material on the basis primarily, of the serviceability to the patient.

The one great objection to amalgam in large cavities is its tendency to flow under stress, and it is this quality that makes it a very questionable filling material for M. O. D. cavities.

The "flowing under stress" acts very much as a wedge in a tooth and where that tooth is weakened, as is usually the case in the cavities under discussion, the result of the strain usually means the breaking down of the tooth by a fracture of either the buccal or lingual wall, or plate, as it is sometimes called.

Prior to the use of the gold inlay, the amalgam fillings in M. O. D. cavities were much more numerous than they are now, and it is hoped that in time they will be entirely replaced by the inlay.

In using the gold inlay in the first class of our cavities, or those where the pulp needs not to be removed, it is very essential that the margins should be beveled sufficiently to protect the buccal and lingual walls and cusps. This will throw most of the stress on the gold, which can withstand it, and so lessens the liability of fracturing the buccal or lingual plates when an angular and undue strain is applied.

The cavity should also be carried to points where it includes all pits and fissures of that surface.

Sometimes we find in molars that the cavity for the inlay can be carried into the buccal and lingual pits. This, indeed, gives a great deal of added strength and is a very desirable procedure in a great many cases.

In our second class of cavities, namely, those where the decay has been so extensive as to necessitate the removal of the pulp, a more serious case presents itself.

In removing a pulp it is necessary to cut away the dentine overlying the pulp. The removal of this and the fact that the mesial and distal portions of the tooth are already more or less absent in M. O. D. cavities, leaves us only two plates, the buccal and lingual intact, and these are very weak. Even the building up by means of cements adds little to the strength of these walls.

When an amalgam filling is placed in such cavities, it will result, sooner or later (and usually sooner), in the fracture of either or both of these remaining walls.

A larger gold inlay is often successful, provided we can strengthen the walls by a decided bevel of the margins of the cavity, and extending the cavity so as to include the buccal and lingual pits in the molars. By so doing, the inlay forms a sort of staple over the weak walls and prevents, to a certain extent, the fractures under stress.

We find a great many cases where even the gold inlay and the desired extension is a question as to the service to be rendered. Where such is the case, the tooth had better be crowned immediately.

The fracture of a cusp or of one of the remaining walls in the M. O. D. cavity would not be so serious if we knew just where that fracture would take place. However, in a great many cases it does not break bluntly, but extends lengthwise and causes a longitudinal fracture of the root. This, in most cases, necessitates the extraction of the tooth and its complete loss, while a "staple" inlay or a crown might have given service for a long time.

Such, in a small way, are the conditions with which we meet in dealing with so-called M. O. D. cavities. It is to be hoped that the present trend of the profession and laity toward preventive dentistry will, in time, eliminate such large extensive cavities from our daily practice.

However, while they exist, it should be our aim to meet such conditions and deal with them in such a way as to secure for our patients the maximum service of the dental organs.

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## WHAT SHALL BE DONE FOR THE POOR?

By L. W. Dunham, D.D.S., New York

Many dentists are awakening to the fact that, as a whole, the profession has been underpaid, largely because of ignorance of the true costs of service. This awakening has naturally resulted in a gradual raising of fees, and has developed certain advocates of higher fees who preach higher fees without giving a sound reason for the increase, with the result that their motives have been questioned, and men who are basing the increase on sound business and professional principles are being condemned.

The critics of profitable dentistry make much of the fact that 80 per cent. of the people can ill afford dentistry at any price, and that in order to do our duty to "humanity" we should continue to work for fees which do not permit of the profitable maintenance of our practices.

Because a few sincere men who have worked throughout a lifetime at low fees, have, by continuous self-denial and rigid economy, succeeded in saving a little money, they believe that dollar amalgam fillings, five dollar gold crowns and ten dollar plates are profitable, and that any attempt to show that such fees are not sufficient is mercenary and commercial, and lowers the tone of the profession.

They urge that raising the general average of dental fees will further prevent the working classes from receiving the dental services which they so urgently need, and that, as a consequence, the tendency to raise fees should be condemned as little short of inhuman, and a cold blooded shirking of "duty."

As a matter of fact, the profession has been fulfilling its "duty" to society far better than to itself, and better than society is fulfilling *its* "duty" to dentistry.

Up to the present time the dental profession has been performing such of the duties of society as a whole, as have come to them (charity cases), and the oral hygiene movement has only brought to public notice the immense amount of dental service needed, and which should be attended to at once, but *not by the individual dentist.*

Many dentists perform a large number of operations for charity each year; also a large number at reduced fees, but under existing conditions it is all wrong. Every operation performed for the very poor, without charge is a plain assumption of the duties of society at large, and just so long as individuals assume the work of society, just so long will society shirk its duties, and turn over to private charity the work which should be performed by the state.

The history of the oral hygiene movement is marked by the efforts of public spirited dentists to bring to the attention of society the frightful dental conditions existing in the mouths of school children and others. These conditions are largely the result of ignorance on the part of parents and the general public, and as many of those afflicted come from very poor families it becomes quite evident that some provision should be made for doing the necessary repair work without charge.

The need for dental work was emphasized before any definite plan was formulated for performing the necessary operations.

At first individual dentists donated their services for a certain number of hours each week, until private charity made possible the services of a paid operator. Finally, in some instances the city authorities recognized the importance of the work and the responsibility of society, and took over the work started by private philanthropy, and placed it where it belonged, under the control and at the expense of the city.

Examples of private philanthropy such as the Forsyth Dental Institute in Boston, and the Rochester Dental Infirmary, the gift of Mr. George Eastman of Rochester, will for a long time take the place of institutions conducted by the community, but after all they are only doing the work which should be done by the community, and while noble examples of charity and kindness, they only tend to put off the day when society will assume its responsibilities, and provide means for caring for its dental dependents, just as it now provides hospitals and district physicians for its medical poor.

When actual personal charity is considered, it is the poor who help the poor.

The dentist whose income is only moderate, and whose practice is located near the poorer quarters of a city is usually the one to whom the actual poor will apply, rather than to the "fashionable" dentist, who is reputed to be "high priced" and whose offices are usually situated in an "exclusive" neighborhood, and luxuriously furnished. Of course, the more prosperous dentist has his charity problem in those patients who form the class known as the "genteel poor" who came to him early in his career, or patients whom Fate has used unkindly; but in the larger aspects

of the problem the charity work performed by the more prosperous dentists is negligible.

Under present conditions the burden falls upon those who are least able to bear it.

Since any real change from existing conditions must come gradually, some method for better meeting present demands is in order, and unquestionably the putting of every dental practice on a business basis, so far as its business side is concerned, *is such a method.*

No one can deny that a dentist who is conducting a profitable practice is better able to dispense charity without depriving his dependents of material necessities, than is a dentist who is barely able to eke out a livelihood because of starvation fees and poor business methods; also, it does not appear that prosperity, in itself, changes the nature of a man who is normally charitable.

To raise dental fees arbitrarily on the plan of charging "all the traffic will bear," is indefensible, but to adjust dental fees according to actual cost of conducting a dental practice, and legitimate remuneration for the skill and knowledge of the operator, is not only good business, it is *morally* necessary, because in no other way can a dentist fulfil his obligations to his family, his profession and the community of which he is a citizen.

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## GARDEN PSYCHOLOGY

Imagination is a thing
That always quickens in the spring
  Like running sap.
The gaudy floral catalogue
Has endless charm and power to jog
  The dullest chap.

But Wiggins is a mortal, grim,
Imagination is to him
  A beastly bore.
A primrose in the seedman's book,
Is but a lithograph, gadzook,
  And nothing more.

## WORKING PLASTICS WITH CARBON DIOXIDE

By J. W. Smith, D.D.S., Madison, Minn.

A plastic, from a mechanical standpoint, is king of all filling materials. Amalgam, if used properly, ranks as high as the best gold inlay.

Three points are absolutely necessary in making a high grade amalgam filling.

I. The formula must be right.
II. The condensation must be high.
III. The set must be rapid.

In speaking of the formula in general it should be prepared from pure metals, and must be balanced to a slight expansion. The mere fusing together of pure commercial metals in the air does not give a pure alloy; oxides will be formed. Oxides will slow up or retard the setting of an alloy. A high grade alloy of good balance and great purity will of necessity be a very rapid setting amalgam. The ageing process is a process, mainly one of accumulating oxides.

The best alloy for an amalgam filling is, therefore, an alloy of good balance, prepared from pure metals, free from oxides, fresh cut, and not subjected to any quick or slow ageing process.

Manufacturers make what they can sell; if they did not they would not be manufacturers very long. I do not know of any manufacturer who has ever tried to see how quick setting an alloy he could make. The tendency has been rather to hold back the alloy for a reasonable working time, for the very good reason that the medium setting alloys are the best sellers. If the demand was for a very rapid alloy, without doubt such an alloy could be made much faster than the very fastest alloy that is made to-day.

The dentist, given as high a grade alloy as is made, is confronted with the problem of getting as much out of it or into it as is possible. Were it just a matter of mixing with the proportion of mercury recommended by the manufacturer and forcing into the cavity, or a matter where good or poor technique produced nearly as good results, then the problem would not be worthy of consideration.

However, a great difference is seen in the amalgam fillings made from the same alloy when worked in a more thorough manner.

The mercury content in itself, a difference between 35 per cent. or 50 per cent., whether high or low, results in no material difference in the strength of the resulting amalgam; but the condensation obtained in re-

ducing the amount of mercury used to 35 per cent., if 50 per cent. were used as a start, will very materially affect the strength of the amalgam.

It is a well known fact in every practice that plastic amalgams nearly always fail, and that dense amalgams seldom fail.

Three methods are possible to obtain condensation:

I. Mix the alloy with an excess of mercury, and work this out in the cavity.

II. Mix the alloy with an excess of mercury, and wring out a little as it is needed.

III. Mix the alloy with just enough mercury to bring to a plastic condition, wring dry and prevent its setting with carbon dioxide snow.

In passing, I wish to say that a good amalgam filling can be produced by any of the three methods, although the carbon dioxide is superior to either of the other two methods.

The purpose of this article is to explain the carbon dioxide method of working plastics, as I believe this method is unknown to most dentists.

The failure in using amalgam is due to the fact that it is used as a plastic with little attention paid to condensation. Wet amalgam is a plastic; dry amalgam at best is only semi-plastic; it does not flow under the plugger, and when subjected to force condenses.

In preventing the setting of amalgam, the fact that mercury is a solid at —40 degrees is taken advantage of. An amalgam is an alloy of two or more metals, one of which is mercury. Mercury content at amalgamation is about 50 per cent. This is reduced to 35 per cent. or 40 per cent. by wringing. If now the amalgam be quickly reduced in temperature to —40 degrees the mercury becomes a solid content instead of liquid, and as a solid cannot amalgamate with the other metals.

To restore conditions whereby setting can go forward, it is only necessary to raise the temperature above —40 degrees. This causes the mercury to melt and crystallization goes forward. When introducing the amalgam into a vital tooth the temperature is raised to approximately body heat by holding between thumb and forefinger for a few seconds. The temperature rises very rapidly.

The agent whereby this reduction in temperature is so quickly accomplished is carbon dioxide snow. Carbon dioxide snow is made from commercial liquid carbon dioxide or soda water gas. The gas, contained in drums of twenty pounds' capacity, is under high pressure, and liquified. When released through a fine feed it expands very rapidly, causing part of the gas to freeze into a pure white crystal or snow, of a temperature between —70 degrees and —110 degrees, depending upon its density. The snow is retained in a collector, the gas which was not frozen passing

out into the air. The gas is odorless, non-poisonous, non-combustible, and will not support combustion.

The collector is a strong brass cylinder of a shape and size to conveniently carry out the work of preventing the setting of amalgam and mixing cement. It is screwed to the outlet of the drum, which lies or stands with the valve end lowest, and a fine spray of the liquid is released into it. The snow deposits very rapidly, requiring about thirty seconds to completely fill the instrument. After collection the instrument is unscrewed and carried to the operating table. The amalgam is prepared, the only changes from ordinary procedure being to wring it as dry as possible. It is then broken up in pieces of convenient size and placed in direct contact with the snow. It will not set a particle as long as the snow lasts.

The snow volatilizes very slowly, one inch lasting over thirty minutes. The cost is about three cents a filling.

To use, it is picked up with the foil carriers, held in the fingers to warm, and packed with hand or mallet force into the cavity. The use of small pieces, through condensation with special attention given to making fine margins, is advocated.

The mixing of silicates above the dewpoint is not new. To work them below the dew or even frost point, and not have the dew or frost affect or change the formula of the liquid involves the introduction of a small glass mortar, instead of the slab, into the necessary equipment.

Dew or frost will not deposit on the inside of a tube closed at one end, although the temperature of the tube is far below the dew or frost point. The reason for this is that before any amount of dew or frost can deposit it is necessary that there be maintained a free circulation of air. The small amount of moisture present in the air in the tube will be deposited but no more. This is so small it is scarcely perceptible. The air in the tube is cold and heavy and cannot be displaced by the lighter air above. The small glass mortar used is practically a tube, as described, and dew or frost never collects on the inner surface. In mixing a silicate by this process the snow is collected, about one inch is right, the mortar is then inserted in the open end of the collector and the instrument inverted on the table. A false or movable bottom is provided in the collector. This is then driven down, packing the snow around the mortar. The instrument is then returned to an upright position, the liquid is dropped into the mortar, the powder being added in successive stages and thoroughly mixed with a glass rod or pestle.

Mixing may be done at any time as no chemical action will take place so long as a reasonable cold temperature is maintained.

The mix may be taken from the collector one hour after mixing and will be found perfectly plastic.

It may readily be seen, therefore, that by this method of working plastics, that two, three, or more cavities can be prepared, and all filled with the same mix. This is true of either the amalgam or the silicate.

If the cold slab is preferred for the silicate for mixing, and if two or more fillings are to be inserted, the mix may be transferred to a closed glass chamber on the snow, and here, free from set, it can be drawn upon for the remaining fillings at will.

Carbon dioxide snow is very much superior to the spray in the refrigeration of the pulp for devitalization and removal. Surely a low temperature which is at hand, in stick form, is under better control than a spray.

It can be applied to the incisal edge, and as the cold penetrates the tooth, drawn over the labial. The intense cold is more efficient than ether and, as before stated, is under absolute control.

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## FREAKS

By W. M. P.—Oregon.

Two freaks of nature and one of man are shown in the accompanying illustrations.

Fig. 1

Fig. 2

Fig. 3

Fig. 3A

Figure 1 shows a molar tooth which is in all essentials a perfect example of a lower molar, which was extracted from the patient's *upper* jaw.

Figure 2 shows an upper bicuspid with three roots, while Figs. 3 and 3A show an upper molar with a gold crown (?) bearing the cusps of a lower molar.

**The less said about the fit, the better.**

## A SIMPLE CASTING MACHINE

By L. E. Davidson, D.D.S., Lieut. U.S.D.R.C.

Soon after entering dental practice I got the pattern of a simple home-made casting machine that has saved me many anxious hours of work, and has never failed to make a perfect cast when working in either gold, silver, or acolite.

The principle is the simple whirl of centrifugal force.

It consists mainly of an old bicycle pedal, some galvanized iron and a piece of engine cord.

It is made as follows:

Secure a ball bearing bicycle pedal free from rust. Cut the toe guards and turn at right angles as shown in Fig. 1. Drill holes at A and B and attach an iron strap, Fig. 2, 5 in. long to each end by means of rivets or small bolts.

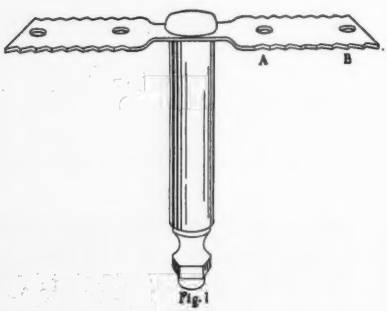


Fig. 1

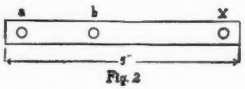
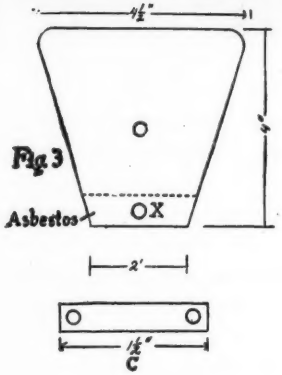


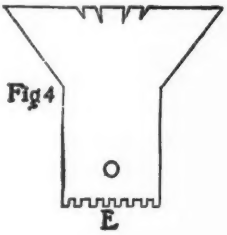
Fig. 2

Cut a piece of galvanized iron, a sort of a fan shape, about 4 in. long and $4\frac{1}{2}$ in. at one end and 2 in. at the other. (See Fig. 3.) This serves as a platform for the "sling" to rotate on. The platform is riveted to the iron strap at X. It will be well to put a sheet of asbestos between the platform and strap to keep the heat from being conducted to the pedal.

We will next consider the "sling." It, too, is galvanized iron (to stand the heat) and is shaped like Fig. 4.

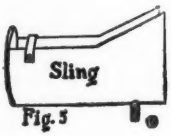
This is bent to form a box or "sling" to hold the inlay ring. The end D is held in place by the cleats cut at E, and the strap C is riveted across the open space at the top of the box. No solder can be used in making the platform or "sling," as of course it would be melted while melting the gold with the blow-pipe. The finished box is shown in Fig. 5.






We may now consider a figure of the finished casting machine in Fig. 7.

The inlay rings Fig. 6 can be cut in 1½ in. lengths from 1 in. gas pipe or the frame of an old bicycle. They fit into the "sling."



A lug G of iron or babbitt weighing perhaps ½ lb. is fastened to one of the beams to serve as a balance. The pedal is set in a base and firmly screwed down to a board, or preferably to the laboratory bench. A small lug or catch is filed at F where the toe guard was cut away, to engage a noose knotted in the end of the engine cord. A piece of engine cord about 3 ft. long is wound around the pedal *unclockwise*; this causes the machine to whirl to the *left*.

## OPERATION

The wax pattern is invested in the usual way in the inlay ring, baked and heated and placed in the "sling." An asbestos pad Z is placed at the mouth of the inlay ring, a nugget of gold placed on it and the "sling" rotated slightly to the *right*. The blow-pipe will soon melt this to a white-hot drop. The cord is given a steady pull with the left hand, the blow-pipe hand-piece is in the right, the centrifugal force thus generated will drive the metal into every detail of the pattern. By the time the whirl-

ing has stopped the gold has congealed, and the ring may be lifted out with a pair of pincers and the inlay freed of plaster. It will be found to be accurate.

Several small inlays may be cast at once with perfect safety.

No jacket of any kind is necessary, as the gold will never be thrown out unless the operator is careless enough to allow it to collide with something.

If the dentist does not wish to construct the caster himself, any good blacksmith or mechanic can construct it at a small cost.

After a few trials you will wonder how you ever used the steam pressure method or got along without this one.

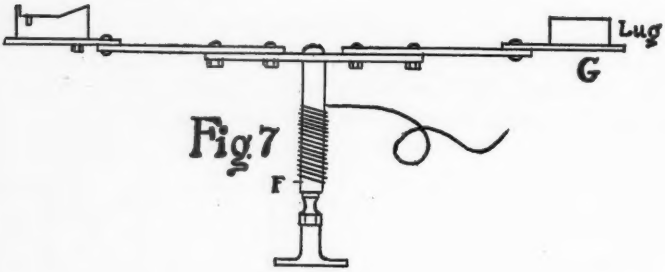



Fig. 7

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## A "GOOD" SALESMAN

A Paris shopkeeper wrote to one of his customers as follows:

"I am able to offer you cloth like the enclosed sample at 9 francs the meter. In case I do not hear from you I shall conclude that you wish to pay only 8 francs. In order to lose no time, I accept the last mentioned price."

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## CREDIT

Through error, credit to Brown Bros. for the picture of Dr. Harry A. Garfield in April DIGEST was omitted.

# INSURANCE OR INDEMNITY?

GEORGE WOOD CLAPP, D.D.S., New York, N. Y.

We are fighting for our liberty; for the privilege of living in a form of government of which we may be as much a part as we choose; for the right to shape our own futures and our children's right to do the same; for the opportunity to develop individual freedom to the largest degree consistent with national welfare.

We are fighting an idea which has been forcible since the first chief over a savage tribe bequeathed undisputed power to his successor. It is the idea that some men are divinely ordained to rule all others, and that the ordination relieves them of all responsibility to those they rule. It is the idea that to such is given the right to say what other men shall do and pay and suffer and to enforce the doing, paying, and suffering.

That idea once dominated the world. By individual, local and national struggles it has been uprooted in some places. The present fight will either fix it again upon the parts of the world from which it has been driven or will deliver the world from it. The foremost representatives of this idea, the rulers of the German people, are too clever to longer claim the theory of divine right for themselves alone. They have persuaded their people that they are a superior race and that it is their destiny and the divine will that they should rule the other and inferior races. They support their argument by pointing to wonderful achievements in science, to great commercial conquests, to prosperity formerly unknown, and to notable accomplishments in the paternal form of government. While they have fixed the attention of their people upon these things, they have taken away liberties we hold priceless.

And now we have come to the crisis between our belief and the other. Fair lands, populous cities and great wealth lie outside the domains of these rulers by divine right. Their power has reached full expression in their own lands, but they have developed a mighty appetite for more power and a great machine which can be used to gratify that appetite. The outlanders, the races dubbed inferior, not willingly surrendering those liberties they have found most precious, it is logical that such rulers should use the machine they have created to take by force what they have not been able to win by other means.

These rulers are willing to pay a great price in treasure and blood for the privilege of extending their power. They are applying the first principle of rule by divine right which is to squander the subjects for the rulers' benefit. It is for the rulers an economical principle, for however much blood may be spilt, it will not be theirs; however much treasure

may be lost, they will have plenty left; however many may die in No Man's Land, they will return safely from the labors of the council table; and however many homes may be bereaved, theirs will go nearly unscathed.

The belief under which we live does not deny that some men are better fitted to rule than others, but it insists that such rulers shall owe their origin and their power to the consent of the governed and be constantly responsible to the electors. To establish that belief some of the greatest among us are giving their labors, their fortunes and their lives. In the practice of that belief this nation has grown great and we, individually, enjoy liberty and security.

The present struggle must be the death of one of these ideas or it must be repeated in the future. It involves every one of us. For us the battle line is not limited to France or to France and our headquarters in Washington. It curves to include our offices and homes, and in these individual salients our part of the battle will be lost or won. We cannot all go to France to fight, or to camps or hospitals there or here to serve. It is not desirable that we should. The front in France and our camps and hospitals here are centres of effort which depend upon us for supplies and support. Our daily activities by which we earn a living and a surplus are our individual munition factories. The Thrift Stamps we buy are our machine gun ammunition. The War Savings Stamps are our shrapnel, Liberty Bonds are our high explosives.

Fate puts a choice of acts and their consequences before us in the most direct form. We must either win for our idea or be conquered by those who rule irresponsibly and who are wasting, like water, the lives of men like ourselves and the happiness of families like our own, that they may gain the right to waste us and ours in like manner.

Those of us who stay at home fight, in part, with money. We do not give this money. We merely put it in the safest possible place in these troubled days when the value of all money, for us, is dependent upon the victory of our principles. We put it there, at a fair rate of interest, to keep freedom rather than to have to buy freedom back. Every quarter we put there insures that the government will pay back to us individually, at least, a part of the taxes levied, which will doubtless be increased, and which will probably endure many years. With the purchase of our first stamp we begin to be capitalists; we have vested interests; an income we do not work for but merely wait for.

Some of us will have to economize to buy stamps and bonds, but if we had begun economizing long ago, or if we began now without the impetus of a war, and bought investments as good as either stamps or bonds, most of us would be better off in ten years than we should otherwise.

The need for money is urgent and constant. If we do our part and win where the battle is now, all will be well. If we shirk and are defeated, we shall pay a greater indemnity than Russia is to pay, which is said to be nearly $5,000,000,000.00.

Every Thrift Stamp, War Savings Stamp or Liberty Bond we buy is a payment on an insurance policy for "life, liberty and the pursuit of happiness." Every stamp or bond we should buy and do not is a possible omen of an indemnity.

Which shall it be, Insurance or Indemnity?

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## PATENTS OF INTEREST TO DENTISTS

1,163,196, Dental pliers, Edward H. Angle, New London, Conn.
1,163,197, Orthodontia appliance, Edward H. Angle, New London, Conn.
1,162,970, Dental grinding wheel and mandrel therefor, Edgar P. Binford, Chicago, Ill.
1,163,319, Fountain tooth-brush, Wm. O. Campbell, St. Louis, Mo.
1,163,074, Interchangeable tooth, Israel J. Fink, Cleveland, Ohio.
1,163,141, Artificial tooth, Thomas F. Glenn, Ardmore. Pa.
1,162,941, Hygienic protector for dental handpieces, Louis L. Martin and R. A. McTavish, Toronto, Ont., Can.
1,162,874, Toothpick holder, John Ocken, Jr., Arcadia, Iowa.
48,265, Design, Bottle, Thomas L. Schofield, Philadelphia, Pa.
1,164,475, Automatic mallet or plugger, George Croston, Hoquiam, Wash.
1,164,597, Tooth-brush, Roy A. Darling, Pellston, Mich.
1,164,599, Crown tooth, Adelbert Fernald, Boston, Mass.
1,163,922, Producing carbon monoxid from carbon dioxid, Charles B. Hillhouse, New York, N. Y.
1,165,149, Matrix device, Frederick J. Bonnalie, Chester, England.
1,164,987, Method of and apparatus for projecting Roentgen images, Gustav Bucky, Berlin, Germany.
1,164,997, Dental amalgam, Thomas J. Davis, New York, N. Y.
1,164,715, Dental tool, Carl M. Hedmen, Chicago, Ill.
1,165,937, Dental flask-closing device, Robert Booty, Toronto, Canada.
1,165,964, Anchor for artificial teeth, Gustav E. Fritz and T. G. McMahon, Chicago, Ill.
1,166,269, Tooth-brush, Hallie M. Smith, Bedford, Ind.
1,166,033, Dental chip-blower, Frederick S. Yoder, Wernersville, Pa.
1,167,353, Anesthetic apparatus, Albert C. Clark, Chicago, Ill.
1,167,341, Mechanism for upsetting heads on fastening pins for artificial teeth, Karl Finck, Berlin, and P. Almstedt, Berlin-Baumschulenweg, Germany.
1,167,062, Dental saliva-ejector, Ferdinand Groshans, Baltimore, Md.
1,166,766, Orthodontic appliance, Harry E. Kelsey, Baltimore, Md.
1,166,462, Breath deflector, Thomas J. King, Richmond, Va.
1,166,924, Rubber dam clamp, Freeman H. Newlin, Huntingdon, Pa.
1,166,796, Anatomical manikin-head, Faneuil D. Weisse, New York, N. Y.
1,166,732, Dental floss holder, Denis K. Woodhouse, Chicago, Ill.
1,168,052, Dental instrument, Wm. W. Bolls, Washington, D. C.

**Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.**

## PREPAREDNESS LEAGUE OF AMERICAN DENTISTS

This is a personal letter to the State Directors.

I try from time to time to visualize what you are doing, and how the work is going in your State, and can only judge of the operations performed by the reports received at Headquarters and by the letters received from you and others in your State.

We are glad to have you write often and keep us posted on League matters in your State, as it gives both help and encouragement at Headquarters.

We shall also try to keep you posted as to how League matters at large are progressing for your interest.

I would advise that you occasionally send a letter of encouragement to each of your County Directors. It will keep them in closer touch with you, and they are apt to take a greater interest in their work.

The League has a membership of 13,600 to date. This number should be increased to 30,000 members at once. Ask your County Directors to endeavor to get every member to enlist at least one more new member.

The United States now has more than 1,500,000 men under arms, and up to date we have records of work done by the League of, approximately, 200,000 operations, but if each had done his part, this number would have been doubled. Some individual members have performed as many as 150 operations; others (new members), none at all, as they have not yet had the opportunity.

Our organization should perform 1,000,000 operations for the men of the next draft.

It is important to keep before the minds of all members, the fact that we should devote our energies almost entirely to men qualified for general military service. These are the men who will do the actual fighting

and who must live in the trenches, and who, consequently, are more subject to sickness and infection.

There seems to be a misunderstanding on the part of some as to what the dental requirements are to fit a man for "General Military Service." He must have six opposing incisors and six opposing masticating teeth (either bicuspids or molars). These bicuspids or molars may be all on one side or part on each side, but there must be at least three above and three below, each of which must touch some tooth on the opposite jaw.

The most important thing to do for these men is to rid their mouths of bad roots and infected teeth, or any tooth having a history of periodical abscess.

After the mouths are freed from infection and the gums healed, plates can be made by members of the League who desire to do so, or they can be made after reaching the cantonments, if the officer in charge deems it necessary.

The mouths, however, must *first* be made free from infection. Then, if possible, any large cavities in the remaining teeth should be filled and the teeth cleaned.

The lack of the minimum number of teeth (six and six) does not excuse any man from *military* service, but only from "General Military Service."

The man who has less teeth than the minimum required for *general* military service can be accepted (if otherwise fit) for limited military service, even if he has *no* teeth.

These men for limited military service will cook food, drive wagons, and auto trucks, carry supplies, work in factories, shops, or storehouses, etc.

Perhaps you wonder sometimes what is being done at Headquarters, and I feel sure you will be interested to know.

A résumé of some of the things done here since January 18, 1918, will give you an idea of the work and expense involved.

Some time during that period you received an envelope containing the following literature:

1. Letter from Dr. Ash
2. " " Lt. Heckard
3. Membership Application Blank
4. Questionnaire
5. Chart of Organization

These, with the envelope, made a total of 6 pieces, and one of these was sent to every dentist in the United States—48,664 in all. Multiply that by 6, and you have 291,984 separate pieces.

These 48,664 envelopes had to be addressed. It took two girls and an addressograph machine three days to accomplish this.

It took twenty-six girls a week to collate and fold, insert, seal, and classify this batch.

They were classified by States, and those for the most distant points mailed first, and those for New York last, so that they would all reach their destination about the same time. This method, as far as possible, is followed in all of the mailing from Headquarters.

One of the pictures in our literature shows the addressograph, addressing 51,135 Form 1 cards (after adding Porto Rico and Alaska to our list). These required six days to address, being a little more difficult to handle because of it being a double card.

Another picture shows a stack of boxes containing about one million pieces, Form Cards of various kinds, which are ready for shipment.

The two other pictures show corners of one of our workrooms, one showing some of the materials stacked up; the other showing some of our help at work.

This, however, only gives you a vague idea of what has been done, because we have had as many as thirty-five people at one time working to get letters, cards, etc., out quickly.

Of the Form 3C card, there were sent out within this time 261,900 without the return address and 123,000 with the return address—a total of 384,900,

There were sent out, of Form 18, 63,110; of stickers, 729,610; certified charts, 4,630; plain and franked envelopes, and stationery to State Directors, 32,050; large maps on League work, and charts showing plan of organization, 106; Letter on Organization by Dr. Ash (7 pages), 424 copies, making 2,968 pages; Instruction message of Lt. Heckard (7 pages), 606 copies, making 4,242 pages; Hammond Railroad Map to as many of the Directors as we were able to procure maps for, showing railroad lines, etc., 39.

We have also sent out to new members about 7,800 League buttons. Each button was accompanied by an acknowledgment slip, and another application blank with a request for a new member.

The foregoing, together with daily correspondence and miscellaneous business, has kept us fairly busy.

In addition to this, we are preparing some lantern slides which will be added to others being made by Dr. Beach. This series of slides will be made up in the form of a story or lecture, and probably twenty-five sets will be made and sent to various State Directors, for use in their State by County Directors, and then passed on. It is hoped this will arouse enthusiasm, and make every man not only willing, but eager, to do his bit.

**Some of the States are organized to a man. Oklahoma, for instance,**

has more dentists who are members of the League, by four, than are found in our latest list of registered Dentists in that State.

Forty States are sending in report cards. From eight States we have received no report cards. The States which make the best showing are those which take the cards and follow instructions sent out from Headquarters.

Much time and thought have been expended on the question as to how best to handle this work, and the message of instruction as to procedure is the result of this time and thought, and these instructions should be followed.

All Form 3C cards should be mailed by dental operator to National Headquarters, 50 East 42nd Street, New York City, and all Form 18 cards to headquarters of State Director.

CHAS. F. ASH,
Director General for the United States.

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## QUALIFICATIONS FOR DENTAL SERVICE

No applicant may under existing law be commissioned in the Dental Corps unless he is between 21 and 32 years of age, a citizen of the United States, a graduate of a standard dental college, and of good moral character, nor unless he shall pass the usual physical examination required for appointment in the Medical Corps, and a professional examination which shall include tests of skill in practical dentistry and of proficiency in the usual subjects of a standard dental college course.

Whether or not the applicant is married has no effect upon his eligibility for the Dental Corps.

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## PAIN AND THE OPTIMIST

Pain itself is not without its alleviations. It may be violent and frequent, but it is seldom both violent and long-continued; and its pauses and intermissions become positive pleasures. It has the power of shedding a satisfaction over intervals of ease, which, I believe few enjoyments exceed.—*Exchange.*

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## PROPERLY DEFINED

Fundamentally socialism is an appeal to egotism, to envy, hatred and greed; an appeal which, Russia's experience shows, sows and quickly reaps a crop of spoliation, outrage and murder.

# DIETETICS AND HEALTH

## A DENTIST AND HIS BOILS

By Watson W. Eldridge, Jr., M.D., New York City

Dr. A., a dentist in middle life and apparently in good general health, presented for treatment under conditions which proved to be of unsuspected importance to him.

The immediate trouble was a series of boils which were unpleasant in appearance, painful in character, and seriously interfered with his practice. They had commenced some months before his presentation. A slight swelling appeared on one wing of the nose near the tip and developed into a small but painful boil. The appearance was unpleasant because it caused the entire end of the nose to swell and redden. This boil burst and for a time all was well. A little later the tip of the nose on the other side of the median line became inflamed and another boil developed and ran the same course. This history continued, first on one side of the nose and then the other for two or three months. At the end of that time the boils changed their location to the back of the neck and increased in size and frequency. During a part of this time they seriously interfered with the Doctor's practice, because of their very unpleasant appearance, because of their painful character, and because he could not afford to appear before patients for months at a time with a series of boils which could not be bandaged, or with bandages covering they knew not what.

When the doctor presented for treatment, the boils had become localized on the back of the neck and one of them had reached a stage which required immediate surgical interference to prevent extensive tissue infiltration and destruction. A policy was then settled upon of enucleating each boil as soon as it assumed definite form, and filling the cavity thus formed with tincture of iodine. This proved efficacious in aborting the boils, but did not prevent their formation. It had the further disadvantage of being decidedly painful, so that the doctor, as he expressed it, "grew tired of having it done" and it left a small scar in each location.

With increasing frequency of recurrence and the increasing severity of those not aborted, it was evidently not sufficient to operate on the boils when they appeared, nor to allow them to continue without an effort to check them, on the theory that they were expressive of something in the system which the system was trying to get rid of and which should be allowed to come out. It was evident that the boils were expressions of some pathological condition in the system, not then recognized, and that it was important to Dr. A's welfare that this condition should be identified and, if possible, corrected. Working on this theory, exhaustive investigations were commenced and, happily, developed knowledge of the greatest importance to the doctor's physical welfare.

The most exhaustive tests for specific infection were negative, supporting the doctor's statement that there never had been any specific infection. There was no history of loss of weight or of general illness, or of loss of vigor other than might be accounted for by close confinement and hard work.

Urinalysis showed nothing abnormal in the urine.

Thanks to recent advances in laboratory science it is now possible to make analysis of the blood, such as was impossible a few years ago, and to determine the proportions of certain substances, which though present in health in fairly well recognized quantities, are forerunners of ill health when present in excessive quantities. As a result of this qualitative and quantitative analysis and the discovery that one or more of these substances was accumulating in the blood in excessive quantities, it has been practicable to make diagnoses which were formerly impossible, to institute corrective measures while they could still be effective and to achieve, in some cases at least, very gratifying results.

The preliminary steps in investigation of Dr. A's physical condition having revealed nothing pathological, a blood examination was made, and some facts which were very suggestive, though not wholly conclusive, were immediately learned. The importance of these facts will be better understood if an elementary description of what is sought for in a blood analysis precedes them.

The report of a qualitative and quantitative analysis of the blood is usually made under six headings, as follows: Non-Protein-Nitrogen, Urea-Nitrogen, Creatinine, Uric Acid, Sugar and Alkaline Reserve. Non-Protein-Nitrogen is the amount of nitrogen in the blood in combination with other elements than those which result from the metabolism of proteins of the body. The Urea-Nitrogen is the amount of nitrogen in the blood which results from the metabolism of the proteins of the tissue. Creatinine is one of the results of metabolism of protein compounds. Uric Acid results from the metabolism of special proteins known as purin

bodies. The sugar in the blood results from the direct intake of sugar and from the metabolism of the carbo-hydrates. The Alkaline Reserve of the blood is the amount of $CO_2$ in the blood in excess of the quantity required to keep the blood alkaline.

Each of these products, except the Alkaline Reserve, has been spoken of as the result of metabolism of certain kinds of food. Metabolism is a term used to cover that long series of only partly understood activities by which the body converts food into energy and nourishment, and then uses the energy and the nourishment. As a result of the use of the nourishment and energy, waste products are formed and must be collected by the blood and removed from the body; the collection and removal constitute the process of elimination. The eliminative processes are dependent upon the proper functioning of the kidneys, skin and lungs. Intestinal elimination is probably confined to those portions of the food which are unassimilable by the body. The difference between waste product elimination and intestinal elimination should be clearly understood because many people feel that if they have a good bowel movement daily they are fulfilling the requirements of elimination as related to the waste products developed by bodily activity, when such may not be the case. From the foregoing it will be evident that if the metabolic processes involved in the changes in the form of the food or the use of the resulting energy and nourishment are seriously impaired, or if excessive quantities of one or two kinds of food be eaten for a long time, or if the eliminative functions of the kidneys, skin and lungs become deficient, perhaps through lack of proper bodily exercise, the results of metabolism may accumulate in the blood in excessive quantities and threaten the health of the individual.

The examination of Dr. A's blood showed that this accumulation was exactly what was happening in his case, more especially with reference to sugar and indicated that unless the quantity of sugar in the blood could be reduced a diabetic condition was likely soon to supervene. While a relation between the excessive quantity of sugar in the blood and the presence of boils has not been conclusively established, the laboratory expert who made the analysis is of the opinion, as the result of extensive experience, that there is a very close relation between the boils and the excess quantity of sugar in the blood.

During the time occupied by the blood examination, a vaccine was made from the staphylococcus strain present in the boils, and was given hypodermically to build up the resistance of the body to the infection. The blood analysis showed that the case was not one for medication, but was one calling for the immediate institution of measures calculated to reduce the dangerously high quantities of sugar, creatinine and uric

acid in the blood, either by reducing the intake of the elements from which they are made or by increasing elimination or both. Owing to the urgency indicated by the dangerously high quantity of sugar, measures to meet both the requirements were taken at once.

The doctor's diet was altered by the elimination of all meat and by a prohibition as to the addition of sugar in food. That is, he was not allowed to put sugar on any foods or in his coffee, but foods into which a moderate amount of sugar had been cooked were not prohibited. Foods very rich in carbo-hydrates, such as rice, of which he was very fond, were prohibited. Whole wheat bread was substituted for white bread and he was instructed to drink a glassfull of water during each waking hour of the day. He was taken away from his practice and sent on a long vacation, with instructions to live outdoors as much as possible, to engage in outdoor sports which he enjoyed, such as golf and tennis and boating, not to incur mental fatigue, and to keep his mind away his from business. He was told not to return for three months.

It was natural enough that a busy practitioner, happy in his work, should demur at such heroic measures, especially the leaving of his work for so long a time. It was made very plain to him, however, that life and death hung in the balance and that the scale might be very near the tipping point, if the indications could be trusted. He was made to understand that conditions as they then were could probably be controlled, but six months from that time it might be too late and they might be forever beyond control.

Under these conditions he wound up his affairs very promptly and left for a part of the country he had long desired to visit. He bought a small automobile and toured and visited and camped, spending practically the entire three months, day and night, outdoors. He returned in the fall feeling like an entirely different person and reported that with the exception of three small boils which developed just after he started, there had been no further indications of trouble.

A little more than a year has now elapsed since he presented for examination, and he has maintained his diet with only occasional additions of the muscle meats, and some degree of outdoor exercise. He has worked extremely hard all winter, but is very much better than he was a year ago. Recent blood analysis shows that the menace of the excessive quantity of sugar in the blood has been entirely removed, and there is not now the slightest reason for anticipating any diabetic onset.

This is an interesting case of the diagnosis and treatment necessitated by the presence of the boils, enabling a man who is important to his family and the community to avoid unrecognized dangers of the most

serious character, and to place himself again well within the safety zone as to general health.

125 WEST 58TH STREET.

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## HOT WATER DRINKING

A stomach cleansing treatment is often just as important as a rest for the organ. The best ordinary method of stomach cleansing is the drinking of a considerable amount of hot water. Not too hot. Just hot enough so that you can drink it with fair rapidity, and take a considerable amount into the stomach in a short time.

If you are doing this as a treatment for a cold or for a disordered stomach, keep drinking at intervals until you are "full." This simple treatment will relieve many cases of indigestion, if you will let up on eating at the same time.

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## GET RID OF FEAR

A railroad president with a salary of seventy-five thousand dollars says that one of the secrets of success is to avoid the fear of poverty and to acquire peace of mind.

Here is a good starting point for you. *Get rid of fear.* It is fear that keeps you perpetually struggling against terrific odds instead of overcoming them. And this fear comes from the false consciousness of one's inability to cope with the living-getting problem, the fear that one will not be able to provide for oneself, one's family, the fear of humiliation and chagrin from having others know that we are failures, that we cannot make a living for ourselves and those depending on us, the fear of seeing our loved ones suffer without the power of relieving them.

We do not really believe that He who notices the sparrow fall, who clothes the lily, will feed and clothe us. We fear that there isn't enough wealth in the world to go round, that somebody must suffer from lack, and that we shall inevitably be among the sufferers. As though the Father would make any distinction in dealing with His children! As though He had not provided boundless abundance for every human being!—*The Nautilus.*

# PRACTICAL HINTS

**This department is in charge of Dr. V. C. Smedley, 604 California Bldg., Denver, Colo. To avoid unnecessary delay, Hints, Questions, and Answers should be sent direct to him.**

FLOATING THE PIN.—After removing the inlay wax from the cavity with pin in position, it is often a question as to what to do with it until ready for investing. I stick the pin in a cork and let it float in a glass of water. It is easily handled this way.—L. W. H.

REMOVING BROKEN ROOTS.—Frequently the roots of upper bicuspids and molars are broken off, so that it is difficult to extract them with forceps. By using a small rose-head bur oo in the handpiece and drilling as far as possible into the root we can generally remove it by taking hold of the bur with forceps. If this fails try No. 5 S. S. W. tap which is used for anchorage of posts in enamel work, and screw the tap into canal or in the opening where the bur has pulled out and see how easily these small roots can be removed.—L. R. BROWN, *The Dental Review.*

ADVANTAGE OF HOLLOW INLAYS.—There are four very good reasons why the internal part of the wax pattern for a cast gold inlay should be cupped out: (1) In vital teeth, to allow for a considerable thickness of cement as an insulation between the inlay and that part of the cavity directly over the pulp; (2) by diminishing the bulk of the metal, shrinkage is reduced; (3) by forming a retention box in the inlay, added retention is assured; (4) material is saved which otherwise would be needlessly wasted.—*British Journal of Dental Science.*

A HANDY MATRIX FOR LARGE FILLING RESTORATIONS.—One of the most satisfactory matrices for use in those cases in which it is necessary to embrace the whole tooth, especially where the cavity extends below the gingival margin to any extent, is the ordinary anchor clamp band used in orthodontic work. After removing the tube for carrying the bar the band can be quickly and easily adjusted to the tooth and screwed up. This is a much more satisfactory method than using the usual handmade matrix, and has the great advantage of the operator being able to use the band again and again for this purpose.—W. S. WILKINSON, *Oral Health.*

DOUBLE VULCANIZATION.—By this is meant the vulcanization of the base or sub-structure, this to be used in the subsequent steps of bite taking, trial plates, etc., and the super-structure or teeth added by means of a second vulcanization.

Its advantages may be summed up as follows:

1. Provides rigid and well-fitting bases for subsequent steps of bite taking, etc.

2. Provides a means of detecting any possible error in impression or retention before finishing the case.

3. Greatly facilitates developing esthetic features of denture.

4. Renders simple and efficient the process of automatic grinding of the vulcanized dentures.—E. B. OWEN, *Dental Review.*

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## QUESTIONS AND ANSWERS

*Question.*—How can you distinguish whether the pins of vulcanite teeth are platinum or composition?

*Question.*—Give name of publisher and author of most practical and useful text book on "Operative Dentistry" for use as a reference book to solve questions and perplexities that the general practitioner meets with in every day practice.

*Question.*—Devitalized and removed pulp in upper left cuspid for female patient, age forty, filled canal with gutta-percha point after dressing with campho-phenique and inserted synohesic filling in mesial surface. Patient complained of soreness at point on gum on a line with lobe of nose, also that pain was felt when drinking anything cold. Six months after filling I opened the tooth and removed root canal filling and dressed canal with Dentalone—soreness gradually disappeared and two weeks afterward inserted temporary filling after refilling root canal. Temporary filling has been in for about month now and tooth has given no trouble. Do you consider safe to insert permanent filling now? Could there have been any other cause for this trouble other than possibility of canal point going through foramen?

Thanking you for the required information, I am.—J. N. P.

ANSWER.—1st. By the color of the pins; by the little crevices of space around the pin in the soldered in pin teeth e. g. the Twentieth

Century and Trubyte; or boil a tooth in nitric acid; or take the manufacturers' statement.

2nd. If you mean a book to answer such questions as these, I think, as the farmer said when he first saw a giraffe, "There ain't no such animule."

3rd. If you have access to an X-ray machine it would be well to have a skiagraph made. If not, you might as well take a chance and place a permanent filling now. It is possible, of course, that infection may have been introduced at time of original filling, or that due to the period of inflammation due to pressure of canal point through foramen, infection may have been deposited from the blood stream at this point of lowered resistance. And you may possibly have a chronic abscess or foci of infection that will cause the patient no further pain or local discomfort whatever, and yet may be a menace to her future health.—V. C. S.

*Question.*—In a case where one or both abutment teeth are in a leaning position, how is the best way to proceed for taking the impression for a bridge restoration, and what style of bridge is generally indicated?—J. W. E.

ANSWER.—Take a mash bite and impression with one mix of soft plaster. Let it set so thoroughly that you cannot crush a piece between the fingers. When telling patient to open mouth, you may assist by prying between teeth on opposite side with instrument. Impression will of course be broken into two or more pieces in coming out, but pieces can be readily and accurately reassembled and held with sticky wax and pieces of match stick for pouring. Personally I prefer the cast gold inlay or inlay-overlay on vital teeth for bridge abutments and the prophylactic style of construction.—V. C. S.

*Question.*—I have a case where the gums have receded from the six anterior teeth superior and inferior; the necks of the teeth are extremely sensitive to sweet, hot and cold. I have treated these with chloride of zinc and different astringents, cannot use nitrate of silver on account of discoloration. Could you suggest anything to relieve this condition which is just as bad as it was six months ago?—A. N. G.

ANSWER.—Apply chloride of zinc and burnish it with a warm instrument increasing the temperature gradually until it is good and hot. This may be repeated at subsequent sittings and usually an early repetition will not be necessary.—V. C. S.

## CORRESPONDENCE

### TIME FOR ACTION

*Editor* DENTAL DIGEST:

May a dentist's wife say a word and ask a question through the DENTAL DIGEST?

For nearly ten years I have read a good many articles concerning the business side of the dental profession. I perused many of "Brother Bill's" letters and then the comments that followed.

The past year almost every dental magazine has had one or more articles given to this question. All have the same trend. Fees are not adequate and difficulties greater.

It seems to be the same all over the country, in the East, in the West, North and South. Therefore it cannot be the peculiarity of a certain city or town, or of a certain class of patients that causes the difficulties. It must be the dental profession.

What is the matter with it? If the fees are inadequate why do the dentists allow them to remain so? Many of the other professions do not. Look at the lawyers. A fee of one dollar or more for merely a minute's work of witnessing your signature or signing the name. What dentist does not take from ten minutes to half an hour to relieve an aching tooth and charge nothing?

Does the plumber take a few minutes and thaw out your water pipe for nothing, or perhaps charge twenty-five cents? Does the carpenter help you with your storm-windows out of the kindness of his heart?

The present conditions are such that action will soon be necessary. How else can the dentist meet the higher cost of living? How is he to comply with the requests from laboratories and dental houses to pay cash?

Hasn't the United States Government made a beginning by raising the standing of dentists in military service? I realize fully that it isn't a question of just charging two dollars, where formerly one dollar was the fee, or in that proportion, but people must be educated to understand that time is money.

On every hand people want to get something for nothing. They have a firm belief that a professional man, a dentist especially, is making money hand over fist, that he can afford and of course will do "little jobs" for nothing. A woman whom my husband had never seen before came to his office with an aching tooth and wanted relief. He left his patient and gave fifteen or twenty minutes of his time, clean towels, sterilized instruments, etc., and when she rose to go, she remarked, "any charge?"

Appointments are made and more quickly broken. Many seem to think they are doing a great favor by allowing a dentist to work for them. Why? How and where do patients get these ideas?

It seems to me that the dentist of to-day must make up his mind to instruct his patients in their attitude toward a dentist as well as to the care of the teeth. It will take time and patience but isn't it time to *do* something as well as write and talk about it?

Why not take a day, outline a definite plan as to hours to be spent at the chair, approximate number of patients to be worked for, suitable fees for time spent (not necessarily work done), how to choose patients, how to get the money earned, and how to educate your patients along the new lines of carrying on your business and then stick to it?

B. R. D.

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## PIPE PUFFS

NO. 1

Prophylaxis prevents pulpitis, pyorrhea, putrescence, possibly pulpstones. Paucity people practising prophylaxis; Plenty *pretend* practice!

Prophylaxis precludes pulpitis.

Pulpitis: Patient presents; Poor prancing patient!

Practitioner persuades patient, probes, punctures.

Pressure: pity poor patient! pain produced, patient peevish.

Presto! Patient proud, practioner puffed.

NO. 2

Putrescent pulp: Pyogenic.

Papa presents Peter: Pity petted Peter, Papa pets, Peter protests.

Practitioner probes, probably places Pyrozone, places pellet; perhaps Phenol: Peter pleased, pain palliated. Pleased Papa.

NO. 3

Pyorrhea.

Prophylaxis prevents pyorrhea.

Patient presents: Practitioner polishes, pumice: Probes, punishes Patient. Packs pockets. Paints parts.

Probably patient pleased; palaver; Practitioner pretends panacea.

Pleased patient pays practitioner. Proud practitioner pockets pay.

Proud practitioner! Perhaps pious prig!

PISH!

W. H. REABEN, McComb, Miss.

# THE BEST OF CURRENT THOUGHT

[*Dental Cosmos*, April, 1918]

## *Original Communications*


The Relationship of Oral Secretions to Dental Caries: (III) Ferments of Human Saliva Other Than Amylase. By Hermann Prinz, D.D.S., M D.

Effects of Decayed Teeth upon a Child's Progress in School. By Earle E. Johnson, D.D.S.

Vincent's Angina from the Oral Surgical Standpoint. By Harry A. Haines, D.D.S.

Apothesine, the New Local Anesthetic: The Revised Technique of Pterygo-mandibular Injection. By J. S. Shields, D.D.S.

Brief Review of Current Dental Literature. By L. P. Anthony, D.D.S.

The Bearing of Physical Anthropology on the Problems of Orthodontia. By L. R Sullivan, M.A.

Importance of Dental Supervision During Pregnancy. By J. Clarence Salvas, D.D.S.

The Conservation and Utilization of Cicatricial Bands in the Treatment of Jaw Fractures Involving Extensive Loss of Substance. By MM. Gernez and Lemière.

Report of a Case of Follicular Dental Cyst. By R. E. Denney D.D.S.

Traumatism Due to Faulty Co-ordinating Bridge Work. By Paul R. Stillman, D.D.S.

Indirect-Direct Gold Inlay Method. By M. J. Waas, D.D.S.

Engineering Principles Applied to Dentistry. By F. L. Stanton, D.D.S.


## *Correspondence*


A Case of Tooth Germination.

*Illustration*—Dentistry and the War: American Ambulance Hospital at Neuilly, dental department.


## *Proceedings of Societies*


Eastern Association of Graduates of the Angle School of Orthodontia.

Academy of Stomatology of Philadelphia.

Northeastern Dental Association.


## *Editorial Department*


Pending Navy Dental Legislation.

"l'Aide Confraternelle" Honor Roll.

Bibliographical.

Review of Current Dental Literature.

Periscope.

**Hints, Queries, and Comments.**

## [*The Dental Review*, April, 1918]

### *Original Communications*

Attachments to Vital Teeth. By Edward T. Tinker.
The Past, Present, and Future of Plastic Surgery About the Head and Neck. By Joseph C. Beck.
Porcelain Technic (continued from March). By George A. Thompson.
A Consideration of Some of the Important Infections Affecting the Region of the Mandible. By L. Schultz.
Directing the Dental Work at Grant Park Naval Training Station. By B. J. Cigrand.
Making Your Money Earn Money—Safely. By George Lee McCandless.

### *Proceedings of Societies*

Chicago Dental Society.
Odontological Society of Chicago.

### *Editorial*

The Folly of Posing.

### *Editor's Desk*

The Young Lady Assistant Again.
Practical Hints.
Correspondence.
Memoranda.
Obituary.
Progressive Index.

## [*The Dental Summary*, April, 1918]

### *Regular Contributions*

Root-Canal Therapeutics, Sane and Insane. By W. G. Ebersole.
Fractures and Dislocations of the Jaws. By Chalmers J. Lyons.
The Micro-Biological Aspect of Some Dental Inflammations. By Theo. von Beust.
The Treatment and Filling of Root Canals. By O. G. Wilson.
Chloro-Percha Does Not Radiograph. By W. Clyde Davis.
Influence of Mouth Infection on Localized Systemic Disease. By Alonzo M. Nodine.
Preparedness League of American Dentists—Reports, News and Notes.

## A USEFUL BOOK

"Electrolytic Medication" (Ionization) is the title of a treatise on the theory, technique, and clinical applications of electrolytic medication or ionization, a therapeutic agent which is proving very successful in the hands of many dentists and physicians.

Written in a very pleasing, simple style, the book which gives valuable information on its subject, should prove very useful to all who wish to be informed on the application of ionization as an aid in their practices.

This little book, cloth bound, is published by The Ritter Dental Manufacturing Company, Rochester, N. Y., and sent free to all dentists requesting a copy.

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## STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of THE DENTAL DIGEST
at NEW YORK, N. Y.

Published monthly
for April 1, 1918.

State of New York }
} ss.
County of New York }

Before me a Notary Public in and for the State and county aforesaid personally appeared John R. Sheppard who, having been duly sworn according to law, deposes and says that he is the Secretary of The Dentists' Supply Co., publishers of THE DENTAL DIGEST, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

| NAME OF | POST-OFFICE ADDRESS |
|---|---|
| *Publisher*, THE DENTISTS' SUPPLY COMPANY | Times Square, 220 W. 42nd St., New York |
| *Editor*, GEORGE WOOD CLAPP | Mamaroneck, N. Y. |
| *Managing Editor*, GEORGE WOOD CLAPP | Mamaroneck, N. Y. |
| *Business Manager*, GEORGE WOOD CLAPP | Mamaroneck, N. Y. |

2. That the owners are:

| NAME OF | POST-OFFICE ADDRESS |
|---|---|
| THE DENTISTS' SUPPLY COMPANY | 220 W. 42nd St., New York, N. Y. |
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| GERTRUDE L. FRANTZ, Trustee for HORACE G. FRANTZ | Colorado Springs, Colo. |
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| ETHEL F. TOMB | Newton Centre, Mass. |
| MABEL G. DE SANNO | Oak Lane, Philadelphia, Pa. |
| DE TREY & CO., LTD. | 13 Denman St., London, Eng. |

de Trey & Co., Ltd., is a corporation organized under the laws of England, with authorized capital stock of 500,000 shares of One Pound each, ownership of which is scattered over a considerable part of Europe and includes a long list of names unknown to us, and probably a number of banks and other corporations.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

THE DENTISTS' SUPPLY COMPANY
JOHN R. SHEPPARD, *Sec'y & Treas.*

Sworn and subscribed before me this 28th day of March, 1918.
[SEAL] GRETCHEN M. BALTZ
Notary Public Westchester County
Certificate filed in N. Y. County Clerk's No. 420
N. Y. County Register's No. 9366

—My commission expires March 30, 1919

# FUTURE EVENTS

May 14-16, 1918.—Nebraska State Dental Society, Lincoln, Nebraska.

May 21-23, 1918.—Indiana State Dental Society, Claypool Hotel, Indianapolis, Ind.

May 21-27, 1918.—The North Dakota State Dental Association will hold their Annual Meeting at Grand Forks, No. Dak.—ALBERT HALLENBERG, Fargo, No. Dak., *President;* SOLON CRUM, Fargo, No. Dak., *Secretary.*

May 23, 1918.—The next examination by the Board of Dental Examiners of California for a license to practise dentistry in that State will be held in the city of San Francisco, beginning the 23rd day of May, 1918, at 9:00 A. M. This examination will be followed by an examination in Los Angeles, beginning the 10th day of June, 1918, at 9:00 A. M.—C. A. HERRICK, D. D. S., 133 Geary St., San Francisco, Cal., *Secretary.*

June 3–6, 1918.—Four States Post Graduate Dental Meeting will be held at New Orleans, La., in the Grunewald Hotel. Fee for general meeting $10.—For further information address J. P. WAHL, 1135 Maison Blanche Bldg., New Orleans, La.

June 6–7–8, 1918—The annual meeting of The Northern Ohio Dental Association will be held at Toledo, Ohio.—C. H. CLARK, *Secretary.*

June 10-11, 1918.—Northwestern University Dental School Alumni Association Homecoming Clinic, 31 W. Lake St., Chicago. For information address Dr. M. M. PRINTS, 4235 Lake Park Ave., Chicago, Ill.

June 12-13, 1918.—Georgia State Dental Society, Atlanta, Ga.

June 12–14, 1918.—The Semi-Centennial Meeting of the Georgia State Dental Society will be held in Atlanta, Ga. This Society will celebrate their 50th anniversary.

June 12-15, 1918.—The next examination of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday and Saturday. Application papers can be secured from the Department of Public Instruction, Harrisburg.

June 13-15, 1918.—Kentucky State Dental Society, Lexington, Ky.

June 13, 14 and 15, 1918.—The New York State Dental Society. The 50th anniversary of the Dental Society of the State of New York will be held at Saratoga Springs, New York. A cordial invitation is extended to all members of the National Dental Association.—A. P. BURKHART, 52 Genesee St., Auburn, N. Y., *Secretary.*

June 17, 1918.—The next examination for dentists will be held in Chicago, commencing June 17th. The written work will be in Room 217, County Building, beginning promptly at 8:30 o'clock Monday morning, June 17th. All applicants are requested to bring their dental diplomas to the written examination for verification. Preliminary credentials must be forwarded to this office, with application, photograph and examination fee of $20. The practical work will be held at the Northwestern University Dental School, 31 W. Lake St., Chicago. For further information address—F. C. DODDS, Springfield, Ill., *Superintendent of Registration.*

June 17–18–19, 1918.—The fifty-first annual meeting of the Tennessee State Dental Association will be held in Nashville, Tennessee.—GEO. L. POWERS, Paris, Tenn., *Secretary.*

June 17, 1918.—The Wisconsin State Board of Dental Examiners will hold their Spring Examination at the Marquette College, 9th and Wells, Milwaukee, Wis. All applications must be in the Secretary's hands thirty days before examination.—F. A. TATE, Rice Lake, Wis., *Secretary*, Wis. State Dental Board.

June 17, 1918.—The Next Meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville Beach, Wilmington, N. C., beginning promptly at 9:00 o'clock on Monday morning. For further information and application blanks address DR. F. L. HUNT, *Secretary*, Asheville, N. C.

June 17-22, 1918.—Next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis. Application and other information may be obtained by addressing H. C. MCKITTRICK, Indianapolis, Ind., *Secretary*.

June 19-21, 1918.—North Carolina Dental Society, Oceanic Hotel, Wilmington, N. C.—W. T. MARTIN, *Secretary*, Benson, N. C.

June 24, 1918.—The annual meeting of the Board of Dental Examiners in the State of South Carolina will be held at The Jefferson, Columbia, S. C., beginning promptly at 9 o'clock Monday morning. All applications must be in the hands of the Secretary by June 14th. Application blanks and full information may be obtained by addressing R. L. SPENCER, Bennettsville, S. C., *Secretary*.

June 25, 26, and 27, 1918.—The annual examination of candidates for West Virginia State License to practice, will be held at Parkersburg, W. Va., Blanks and information will be furnished on application to H. H. SMALLRIDGE, Charleston, W. Va., *Secretary*.

June 26-27, 1918.—The Annual Meeting of the North Eastern Mass. Dental Society will be held at the New Ocean House, Swampscott, Mass., Wednesday and Thursday. Finest Hotel on the North Shore. All members of the profession are cordially invited. Hotel rates one-half. $5.00 per day.

June 27-28-29, 1918.—The annual meeting of the South Carolina State Dental Association will be held at the Jefferson Hotel, Columbia, S. C.—ERNEST C. DYE, *Secretary*.

July, 1918.—New Jersey State Dental Society, Atlantic City, N. J.

July, 1918.—Wisconsin State Dental Society, Milwaukee.

July 1, 1918.—The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, S. D., beginning promptly at 9 o'clock Monday morning. All applications must be in the hands of the Secretary by June 24th. Fee for examination $25. No reciprocity or interchange. Full information and application blanks may be received by addressing L. S. SPENCER, Watertown, S. Dak., *Secretary*.

August 1–3, 1918.—The Eighteenth Annual Meeting of The American Society of Orthodontists will be held at the Edgewater Beach Hotel, Chicago, Ill. It is advisable to make your reservations early.

August 2–3, 1918.—The next Annual Meeting of the National Association of Dental Faculties will be held at Congress Hotel, Chicago, Ill.—CHARLES CHANNING ALLEN, N. W. Cor. 10th and Troost, Kansas City, Mo., *Secretary*.

Aug. 5-9, 1918.—The 1918 meeting of the National Dental Association will be held in Chicago during the first week of August. The House of Delegates and the Board of Trustees will meet Monday August 5th, and the meeting proper will begin Tuesday morning and close Friday noon. All sessions, clinics and exhibits will be held at the Auditorium and Congress Hotels, Michigan Avenue and Congress Sts. During the meeting a monument to the late Dr. G. V. Black will be unveiled.